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SPECIAL REPORT

WEB SERVICES

Could Provide Cheap,
Easy Integration—
Here's Why
You're Still Waiting
Inside the Battle Over Standards Page 54

BY CHRISTOPHER KOCH

PLUS

HOW EARLY ADOPTERS ARE MINIMIZING RISK—

Motorola, Wells Fargo, U.S. Navy Page 64

BY ELANA TAYLOR

POST-IMPLEMENTATION AUDITS

How to do them right
without wasting time, money Page 74

LESSONS FROM THE FRONT LINES

Farmers Insurance's CIO learns
the business by living it Page 84



Dave Watson,
vice president
and CTO of
Kaiser Permanente,
is not just waiting
around for Web
services standards
to emerge; he's
active in WS-I,
which focuses on
interoperability issues.

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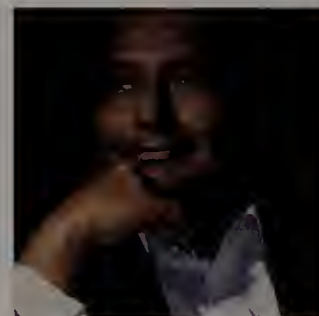


VOL. 17 • NO. 1 • OCTOBER 1, 2003

SPECIAL REPORT

WEB SERVICES

The Politics. The Infighting. The Risks. The Rewards.



Features

SPECIAL REPORT | WEB SERVICES

The Standards

The Battle for Web Services | 54

Everyone wants Web services standards. CEOs think the technology will create new opportunities. CFOs believe it will save millions. Vendors see a pot of gold at the end of the Web services rainbow. And CIOs know that linking to customers and partners over the Internet will revolutionize both business and IT. So what's the holdup? The usual suspects: Politics. Ego. Suspicion. Fear. Greed. *By Christopher Koch*

The Early Adopters

Calculated Risks | 64

Many companies are jumping in to Web services before standards emerge. Sure, there are risks. Here's how some early adopters are managing them. *By Elana Varon*

POST-IMPLEMENTATION AUDITS

It Ain't Over...Until You Do the

Post-Implementation Audit | 74

Scrutinizing every aspect of a finished project and acting on the lessons learned can be controversial and difficult. But post-implementation audits are an important way to avoid repeating costly mistakes. *By Meridith Levinson*

LEADERSHIP

The Business Education of Jan Franklin | 84

Just when she thought she knew everything, this IT veteran spent some time on the business side. What she learned there prepared her to take over as Farmers' CIO when opportunity knocked.

By Alice Dragoon

MORE ►►►

Players in the Web services battle (from left to right): Kaiser Permanente's Dave Watson, Sonic Software's David Chappell, Oasis's Patrick Gannon, Motorola's Samir Desai and the U.S. Navy's Monica Shephard

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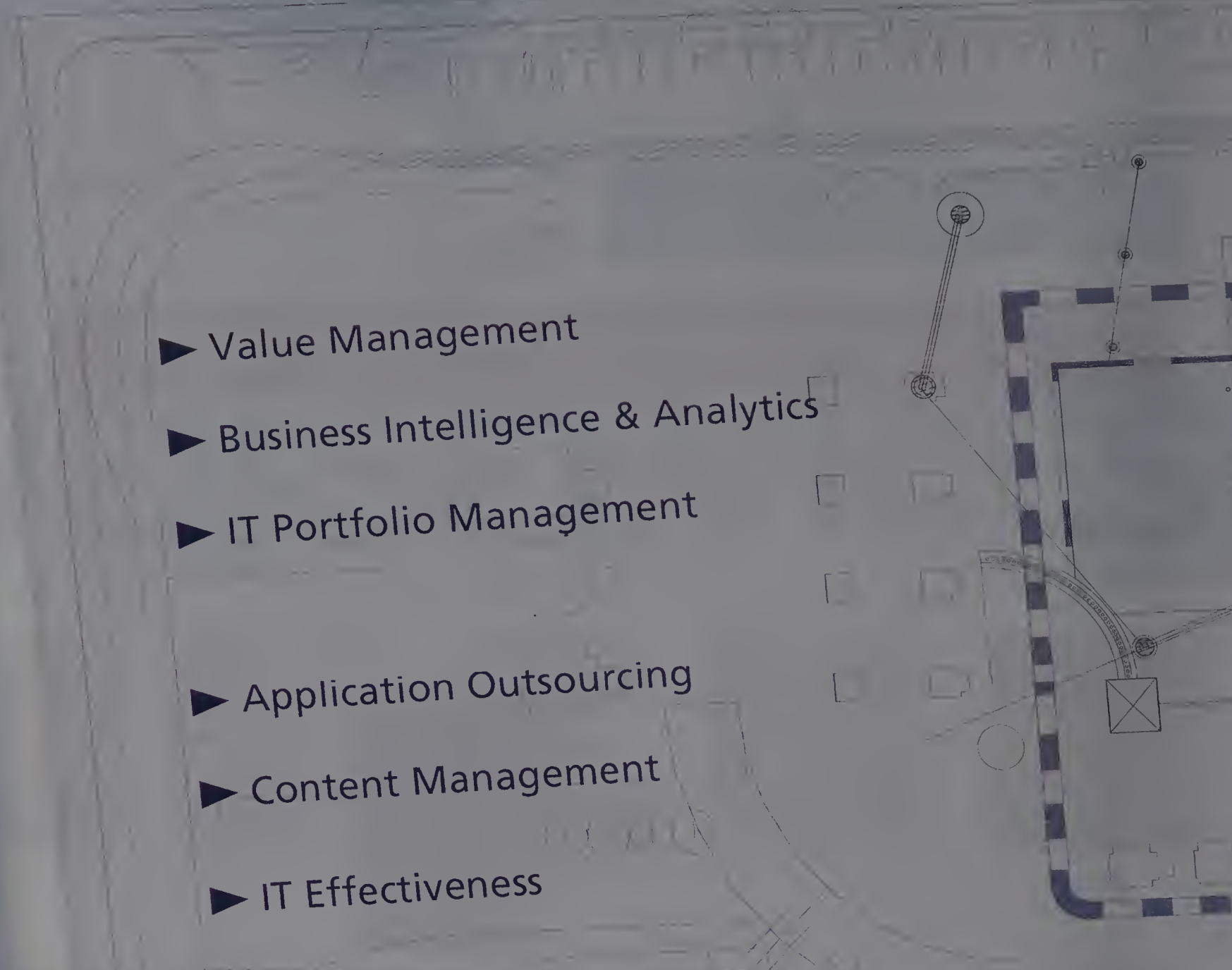
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You don't need a degree in anthropology to negotiate multicultural IT projects. But as this IT exec discovered, having one sure doesn't hurt. *By Patricia Ensworth*

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Knowledge worker productivity: your questions answered. *By Tom Davenport*

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Accepting vague or irrelevant numbers for project value can lead to bad IT spending decisions. *By Jack Keen*

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Readers weigh in with their opinions on this thorny issue. *By Art Jahnke*

FROM THE PUBLISHER Beware of the Telephone | 96

Most of your employees think hacks originate via a computer. According to Kevin Mitnick, they'd be wrong. *By Gary Beach*



"Since all knowledge workers aren't alike, we need to segment them into categories and apply IT approaches differently for each category."

—Tom Davenport, CIO columnist, on knowledge workers Page 44

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Your Guide to Managing

Secrets to Managing Techies

IT employees are different. Here's how to lead them. *By Megan Santosus*

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By Susan H. Cramm



George Lin, CIO of Documentum, requires all IT staffers to understand business processes before they can talk technology.

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Here's how to be more effective with less resources. *By Abbie Lundberg*

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Abstracts of all the feature stories found in this issue.

All those who want more wireless
with less worry... Say i



Technology Risk

Wireless networks offer businesses several advantages. Increased mobility, design flexibility, lower costs. But as with most new technologies, design focuses on functionality – not risk. Wireless technologies do not have the physical access restrictions used in traditional wired environments. They make it possible for someone in the lobby or across the street to have access to a network carrying patient or employee information, sensitive corporate data, or trade secrets.

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Samir Desai, CIO of Motorola

ASK THE SOURCE

How Does One Deploy Web Services?

According to Samir Desai, senior vice president and CIO at Motorola, Web services is about "the throughput, agility and cost-effectiveness of IT. How many times should I code a credit card check? With Web services the answer is one." Motorola has committed to the enterprisewide deployment of Web services (see **Calculated Risks**, Page 64). Quiz Desai on his experiences with Web

services through Oct. 15. Go to www2.cio.com/ask/source.

ADD A COMMENT

Web Services: The Next New Thing or the Newest Headache?

If the vendors can't agree on the standards, maybe it doesn't make sense for you to launch into Web services just yet. (See **The Battle for Web Services**, Page 54.) Or maybe this is the time to get the jump on the competition. What's your take? Go to the online version of this article to **Add a Comment**—and read what your peers are thinking.

LEARN MORE

Nailing the Post-Implementation Audit

What you don't know *can* hurt you. By doing a post-implementation audit (see **It Ain't Over Until You Do the Post-Implementation Audit**, Page 74), you'll get a clear picture of what not to do next time—and solid backup to prove the value of high-cost, mission-critical IT investments. The following Web exclusives will help you nail down doing the PIA, and doing it right:

- ▶ **A Business Case Process**, including sample flow chart that identifies key metrics and project time line
- ▶ **A PIA Scorecard**, for planning the four-step process

- ▶ **A PIA Summary**, for tracking major steps
- ▶ **Also look for** informational sidebars on "How to Select the Right Project for Your First Post-Implementation Audit" and "Doing It Right: Questions to Ask During an Audit."

Peer Resources

More Takes on Web Services

» If Web services ever gets its various acts together (see **The Battle for Web Services**, Page 54), it's just possible that the end user could be responsible for his own applications. Where does that leave the IS department? CIO's sister site Darwinmag.com thinks that might mean we don't need IS anymore. Read **Are You Ready for the IT-Savvy Company?** on www.darwinmag.com.

» Even though organizations such as Motorola and the Navy are plunging ahead with Web services (see **Calculated Risks**, Page 64), they're all going to have to deal with the technology's avowed lack of security. CIO's sister publication CSO magazine offers some tips for Web services pest control in **How to Rope in Rowdy Technologies**. Find the story at www.csoonline.com.

Online Exclusive

Still a little shaky on just how Web services works? Check out our newly updated interactive Flash presentation, "Web Services."

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Tony Menezes, IBM facilitator of open practices, financial industry

Open standards and the taming of the screw.

In 1864, a bolt or screw made in one machine shop wouldn't fit a nut made in another machine shop. Everything was proprietary. In short, a mess.

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Can you see it?

From the Editor

lundberg@cio.com



The discussion on strategic planning and alignment that I had with members of CIO's Best Practice Exchange is just one of many taking place every day. For more information on the Best Practice Exchange, our member-only online networking forum, visit exchange.cio.com.

The Greatest Threat to CIO Success

RIGHT NOW, CIOs ARE STUCK between a rock and a hard place. On one side, there is growing demand for new IT capabilities and high expectations for payoff. On the other, there are greatly constrained resources. This will pose the single greatest threat to CIO effectiveness in the next year and a half, and there's only one way out: better strategic planning and business alignment.

In a recent CIO.com poll, we asked visitors if they were experiencing an increase in IT requests from the business side. Of 405 respondents, 78 percent said the number of requests is increasing. And 32 percent said the quality of the requests is improving (better spec'ed out, higher-value projects).

If IT *budgets* were increasing by double digits, as was common in the late '90s, that might not be a problem. When money flowed freely, as long as the IT organization was aligned with what the business needed and delivered it well, the CIO was considered successful.

That type of alignment is a recipe for disaster for CIOs today. When IT tries to please each and every business unit leader, each and every function head, and those people have competing priorities, there's no way to win. With resources as limited as they are today, you wind up with a scene from *Gladiator*, with the CIO stuck in the middle of a very bloody battle.

I recently asked members of CIO's Best Practice Exchange to describe the most effective thing they

were doing to manage this problem. To a person, the answer was better strategic planning and alignment in the business, and better governance of IT.

The *only* way to be successful when the number of high-value business initiatives (IT enabled or otherwise) greatly exceeds the resources available to deliver them is to get all the business stakeholders to agree on what is most important, and then to agree on how things should be prioritized. That takes a cohesive executive group and some very sophisticated, well-running governance mechanisms.

The challenge in this for CIOs is that, in most companies, this isn't happening, and the CIO who identifies the problem/solution ends up in a new high-profile role of leading the business to prioritize, define and communicate goals for the entire enterprise—not just for any one business unit or function, and not just for IT. Second only to the CEO, CIOs are uniquely positioned to view the business in this cross-functional, process-oriented, holistic way. Second to no one, they are uniquely positioned to think about and lead discussions on IT-enabled strategy and process change. Think this is a stretch? I've talked with two CIOs in the past month who are writing their companies' five-year strategic plans.

Do you agree that this growing imbalance between demand and resources poses the greatest threat to your effectiveness? What about this new alignment? Drop me a line and let me know.

Allie Lundberg

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InBox

Reader Feedback

I.T. WILL DRIVE THE FUTURE

I enjoyed your interview with economist W. Brian Arthur ["IT Reloaded," July 15, 2003] and understand and agree with what he says regarding CIOs becoming ever more central to the success of companies that themselves are relying more on technology. Indeed, those corporations are finding entirely new paths open to them, thanks to technology.

However, I confess to wondering just how much real growth is still possible, given the other impact of technology. It seems to me that our society is in for a sea change insofar as our ability to support ourselves with work in the traditional manner. We still live in a culture where not having a job (and not "being productive") is frowned upon; most people in the United States feel shame if they are forced into an out-of-work situation. However, technology in many forms has taken away the need to employ as many people to accomplish the same tasks.

To use Arthur's example, the railroads surely did allow for Chicago to become the capital of the U.S. beef industry, but did they not also eliminate the need for countless local butchers and cowboys? Or farming—in 1900, the census showed the U.S. population was 76 million peo-

ple, with about 30 percent of them working on farms. Today, less than 2 percent of a total population of 281 million work on farms in America, thanks to tractors and pesticides and genetic alteration.

There are other more techy examples—bank tellers displaced by ATMs, telephone operators by ESS switches, programmers by offshore counterparts who, thanks to telecommunications, can deliver the same work results for less cost.

My point is, we are still producing enough food (even surplus), getting our banking transactions and phone calls

completed, and so on. The tasks themselves are being accomplished, just with fewer people (or fewer people in the United States) involved.

But what happens to those who would like to work but can't find jobs? I remember a sci-fi story called "The Marching Morons," written in the '50s. The protagonist (who had been frozen and then thawed 200 years in the future) discovered a world where a minority of people did productive work; the rest of the population went to work every day unaware their efforts did not accomplish anything. The minority set up "busy work" so that the masses would feel as if they were contributing members of society.

That story comes to mind as I observe what we are experiencing as a society.

Bob Fately, Vice President, Third Wave
Van Nuys, Calif.

Economist W. Brian Arthur Responds: With the steady increase of productivity coming mainly from IT, more work is indeed being done with fewer workers. I'm an optimist about the potential of IT and of the U.S. economy in general. But the fly in this very good ointment is the steady migration of jobs offshore and a

prospect that jobs will recover last in this economy, if at all.

I believe continued cutting-edge technology will create new industries to offset the losses in the old: witness genomics, smart materials, new pharms, nanotech. But these are some way off. I hope that the United States will take a cue from Europe and shorten the workweek. This means making it cheap by every possible means for businesses to hire labor. But failing that, we could see a situation here of combined prosperity and joblessness.

I've been noticing that underneath the bad economic data, businesses large and small have been gradually absorbing the new technology. It has simply taken time to absorb, but the growth is inexorable.

Arthur, whom I consider one of the smartest people around, has confirmed my hunches with historical insights. IT is indeed the wedge that will drive the future, although like any wedge, it takes many thrusts before its work is done.

Paul Arveson

Balanced Scorecard Institute

CORRECTION

An item in the Sept. 1, 2003, "On The Move" column erroneously referred to Lucent Technologies' financial situation. The company has not declared bankruptcy. CIO regrets the error.

WHAT DO YOU THINK?

Send your thoughts and feedback to letters@cio.com. Letters may be edited for length or clarity. For a link to the article mentioned, go to www.cio.com/printlinks.





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How to Reach Us

E-mail letters@cio.com

Phone 508 872-0080

Fax 508 879-7784

Address CIO Magazine, CXO Media Inc.,
 492 Old Connecticut Path, P.O. Box 9208,
 Framingham, MA 01701-9208

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trendlines

the **NEW** the **HOT** the **UNEXPECTED**

Edited by Michael Goldberg

PUBLIC-SECTOR I.T.

Crazy as Usual for California CIO

IMAGINE A TYPICAL DAY in the life of California CIO J. Clark Kelso.

The state department of IT that Gov. Gray Davis picked him to clean up? Disbanded. The state's budget? A \$100 billion mess, balanced through billions in borrowing, slashed spending and new fees. And his job security? As far as Kelso knows, Arnold Schwarzenegger soon could be his new boss, thanks to a free-for-all gubernatorial recall vote set for Oct. 7. And that's *if* the new governor keeps him on. (Adding to the chaos: On Sept. 15, a court ordered the vote delayed until March.)

But Kelso, a Sacramento insider with a reputation for turning around departments

in turmoil, says it's all just politics as usual. "The mass media coverage is all about what a circus it is out here," says Kelso, a McGeorge Law School professor who has helped revive the state's earthquake relief agency and insurance commission. "On the inside, you don't have the sense that the government is in utter chaos."

Crisis is a better word for California's administration, a situation that extends to IT. Aside from the state's first-ever recall election, California must shore up its finances against another mammoth budget deficit next year (the deficit hit \$38.2 billion this year before a July budget deal).

In the midst of this, Kelso tries to move

California CIO **J. Clark Kelso** says state agencies forced to draw up plans for 20 percent budget cuts will find themselves relying more on IT to support core services.



ahead with his IT agenda designed to cut costs without hurting services. He's drafting a data center consolidation plan due Dec. 1, to implement in 2004. His administration is overseeing an \$800 million contract for IBM and other vendors to build a new system to administer child support payments. And since he became CIO in 2002, Kelso has been pursuing a statewide initiative to cut costs by improving interagency collaboration on the state's MyCalifornia Portal (www.my.ca.gov). (For more about Kelso's goals on the portal, see "Dire States," www.cio.com/printlinks.)

Guiding his actions, Kelso says, is restoring stability to the state budget, a factor that

Continued on Page 26

CALL CENTERS

Dial C for Customer

PITY THE POOR TELEMARKETERS. Starting today, these companies that would normally use computers to dial the masses instead must avoid connecting to one of 30 million telephone numbers listed in the Federal Trade Commission's National Do Not Call Registry. Violators risk fines. So, it would appear, you dine in peace.

Well, not exactly. Telemarketers have been investing in CRM and other applications to help them navigate the list of government rules so that they can connect with eligible consumers. (For example, a company may contact customers for 18 months after a purchase.)

Aegis Communications Group, an outsourcer that operates 12 telemarketing and customer service call centers, has spent \$1.8 million since 2000 to replace its homegrown software with



PeopleSoft applications. Aegis plans to convert half of its 5,100 agents to the software by next year.

Gaye Weinberger, senior vice president of business requirements, says the investments will make Aegis compliant with the Do Not Call list and trickier-to-manage rules, such as limits on the use of automated dialing software. Aegis, which saw its revenue cut by almost half between 2000 and 2002 (when it hit \$135.9 million), wants to use the systems to better analyze data about existing and potential customers.

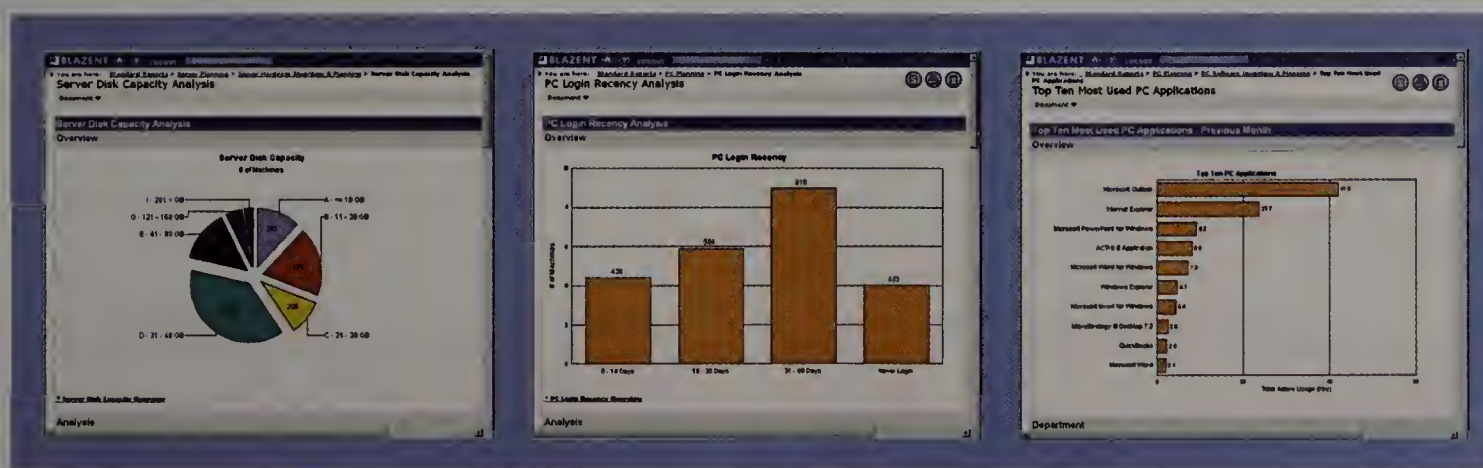
The Direct Marketing Association, which is battling the Do Not Call rules in court, expects more efforts like this, says spokesman Jim Conway. "A common thread running through the preparations of our members is the realization of the increased value of the [existing] customer relationship," he says.

—Stacy Cowley



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BLAZENT
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California CIO

Continued from Page 24

will affect strategic IT decisions for years and force departments to focus on their essential needs. "We need all departments to go back and ask themselves, 'Alright, given a 15, 20 or 30 percent reduction over a two- or three-year period, what do we really think are the core business operations that we should be performing?'"

Ironically, Kelso expects this kind of scrutiny to cause some departments to save money by increasing, rather than decreasing, their dependence on IT.

A case in point is Kelso's plan to consolidate California's two data centers in Sacramento and Rancho Cordova. "We're not sure whether those data centers will actually have less business to do or more business to do," says Kelso. Departments may see the move to one consolidated data center as a way of automating manual processes, or of simply consolidating IT services—e-mail or Web servers, for example—that are now handled at the departmental level, he says. It also could be that the data centers remain in two locations but under a unified management team.

Whatever the outcome of Kelso's IT projects, observers say conditions couldn't get much worse for a state which sells debt notes rated one notch above junk bonds. Any successes Kelso can show could help California bargain for lower debt payments, says Carol Kelly, a vice president of government strategies with Meta Group. That's, of course, assuming Kelso gets to keep his job. —Robert McMillan

Recalling Florida

REMEMBER FLORIDA IN 2000?

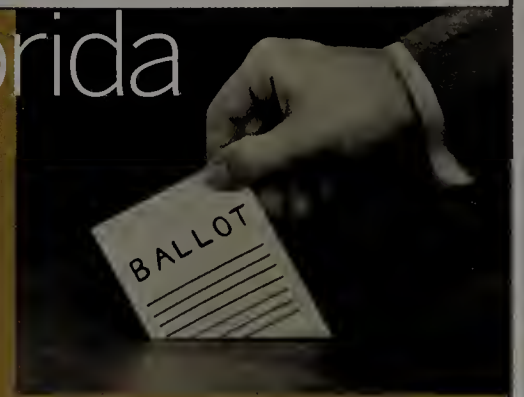
The outdated voting machines and disputed election results? The American Civil Liberties Union (ACLU) of Southern California does, and it has sued to block California's recall election slated for Oct. 7, until the state replaces its punched-card voting systems.

On Aug. 20, a federal judge rejected the request. Though California is under a court order to modernize its voting systems by March 2004, the recall election takes precedence. Voters will choose whether to recall Gov. Gray Davis, and if yes, then pick from a list of 135 candidates to succeed him.

The ACLU of Southern California won an appeal after arguing that the old methods would be unfair to voters in urban areas such as Los Angeles. On Sept. 15, a court said the election should wait until March, after new machines are installed. Even in places where new technology has replaced old, people are worried. Orange

County officials, who installed a \$26.1 million electronic voting system, say they'd like more time to train poll workers. They may rely on older ballots to do the job.

In spite of this uncertainty, Doug Chapin, director of nonpartisan election reform website Electionline.org, says the recall balloting will offer a good test of some new systems before the 2004 elections. Shasta County, for example, will be implementing touch screen voting for the first time this month. "The experience of counties like Shasta could provide a lot of lessons—good or bad, depending on the outcome—for other counties considering last-minute changes next year," Chapin says. —Stephanie Overby



PUBLIC HEALTH

On the West Nile Virus Trail

IN SOUTHERN ONTARIO, West Nile virus trackers with the Hastings and Prince Edward counties' health unit have more than 373,000 square miles to cover. Their job: look for dead birds that might harbor the potentially fatal mosquito-born disease and check standing water for mosquitoes and larvae. Then warn the public about where the virus has been detected and urge people to take precautions, such as wearing pants and long sleeves and using insect repellent.

Since April, the 17 inspectors of the West Nile virus surveillance program have been collecting data (date, time, GPS coordinates for field sites, information about birds,

mosquitoes and larvae) using a PDA application designed for the task. The application, Assur H&S (health and safety), is from Calgary, Alberta-based vendor Carmina Technologies, which specializes in pest control and disease monitoring systems. It is designed for PDAs and has been easy for county inspectors to use, says Glen Hudgin, the agency's director of public health inspection. Users synchronize the PDAs with computers at the office to analyze data collected.

Standalone software applications for PDAs "are fantastic. With an application like this, I imagine you could train somebody in an hour or less," says David Shiple,



a Forrester Research analyst.

West Nile threatens much of North America until the first hard frost occurs (usually October in Ontario). As of Aug. 28, Canada confirmed nine West Nile cases, while the United States reported 1,482 human cases in 34 states, with 24 deaths. Hudgin says the proactive approach helps contain the West Nile risk. "We're quite confident that the work we're doing [in the field] is helping to reduce the risk to the public," Hudgin says. —Nancy Weil

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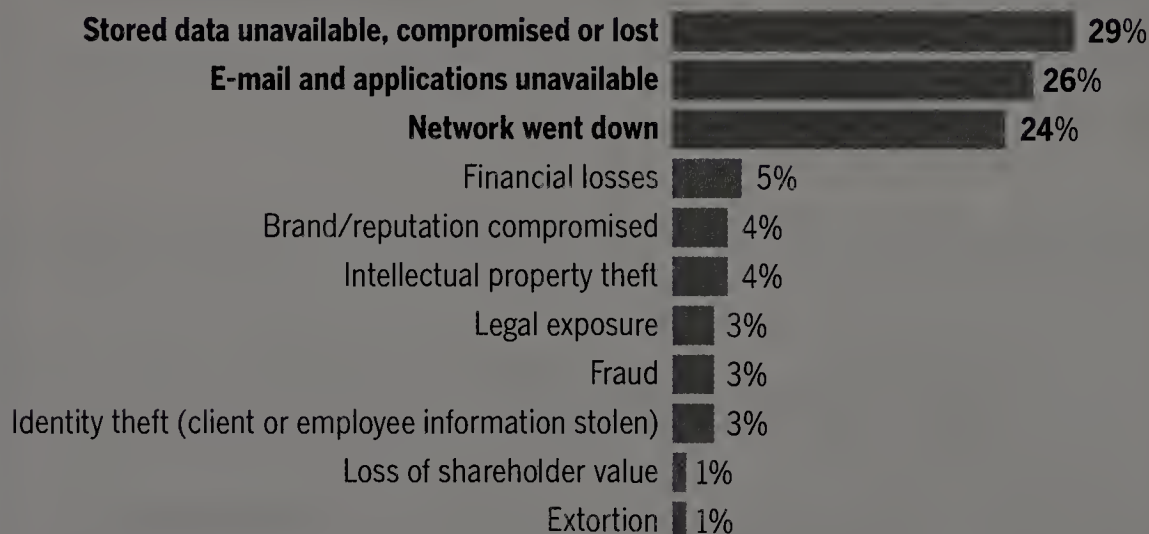
By Lorraine Cosgrove Ware

It's Not Just What You Send, It's What You Store That Needs Encryption

Despite evidence that stored data is more vulnerable than data in transit, companies still focus encryption efforts on data transmission.

It's Time to Protect Stored Data

A recent survey conducted by CIO and PricewaterhouseCoopers found that the most common **result of security breaches in the past 12 months** was the compromise or loss of stored data, just ahead of applications and network availability.



It's Also Time to Make Encryption a Priority

Only 30 percent of IT executives said their companies encrypt stored data, yet it's attacked most frequently.



SOURCE: "State of IT Security 2003," a worldwide study conducted by CIO and PricewaterhouseCoopers—7,596 respondents

Best Practices

Don't lose the key. If you store encrypted data and lose the digital encryption key, you cannot read that data. Depending on the form or encryption you choose, if you store data in an encrypted fashion and lose the digital encryption key or access passwords, you have no way of ever reading that data again. Make sure you have backup procedures and access permissions as part of your encryption strategy, including storing encryption keys and passwords in escrow with a secure third party.

Pick and choose. Some stored information may warrant this additional level of security, such as R&D or sensitive customer records, but other data may not. Companies should frequently review the classification of data and information and determine which assets require encryption.

Align your security policy with your company's business objectives. This will help you determine which data is critical to the business—requiring additional layers of security—and which is not.

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VENDOR RELATIONSHIPS

Vendor Consolidation, A Look Back

MERGERS AND THEIR CONSEQUENCES have again been very much on CIOs' minds with PeopleSoft's recent acquisition of J.D. Edwards and Oracle's threatened takeover of PeopleSoft. The familiar refrain—what will become of the end users?

It's a scenario with ample precedent. Back in the days when John Kennedy lived in the White House, eight vendors dominated the U.S. mainframe market. IBM's share reached as high as 60 percent. The rest was divided among the so-called Seven Dwarfs: Burroughs, Control Data, GE, Honeywell, NCR, RCA and Univac. A few years later, Honeywell acquired GE's computer division and Univac swallowed RCA's leaving a gaggle of IBM-wannabees known by the acronym BUNCH. As consolidations winnowed the bunch, each stage left another customer group bereft of its chosen computer architecture and struggling to adapt.

The lessons from data centers past are both encouraging and disconcerting. Veterans of the mainframe market shakeout say the vendors did try to support their customers' migrations to new systems. On the other hand, they and observers warn that 2003 is not 1963, or even 1983. Today's technology markets are more competitive, and vendor-user relations are not as genteel.

The bottom line: CIOs should expect some important bumps as mature enterprise software markets such as ERP move toward consolidation. The mainframe veterans certainly saw their share.

When the mainframe market consolidated, CIOs of the 1970s and 1980s suffered sleepless nights. And yet, IT veterans say, it was an easier time for technology migrations compared with today's world.

"There were lots of sleepless nights," recalls Paul Strassmann, a former CIO at Xerox, which itself briefly entered the mainframe business. Strassmann, who also served as CIO at the Defense Department, says he was hired by Xerox in about 1970 "to get rid of our IBM mainframes and install our own Xerox mainframes." He did. Xerox ran more than 100 of the systems, he says, but then in 1974, Xerox sold its mainframe business to Honeywell.

Honeywell worked hard for several years trying to make the marriage work, but eventually there weren't enough spare circuit



boards for the Xerox machines, and field service engineers had to develop workarounds, Strassmann says. "Our maintenance costs went up and up," he adds. So, Xerox migrated to Honeywell iron.

Then, in the 1980s, Strassmann's data centers took another blow when Honeywell sold what was left of its mainframe operations to a "maintenance only" unit of Wang Laboratories. The Wang engineers could fix things, says Strassmann, but if you wanted major parts or additional equipment, you had to search the used market. "It was as if they cut off both arms at the elbow," he says.

Despite Strassmann's experiences, though, John Phelps, a vice president at Gartner and himself a 30-year IBM veteran, says most of the mainframe transitions of years past were heavily supported by the surviving vendor. "Usually the vendors developed extensive conversion programs," he says, referring to both software programs and support teams. "It wasn't a large universe of customers, so vendors didn't want to alienate them," he adds.

George Gray, a systems programmer for the Georgia Department of Administrative Services, says that the 1986 Sperry/Univac takeover of Burroughs "was very scary at the time, but they managed to keep delivering the product, especially the software." And today Gray still runs what he terms the great-grandchild of his 1986 Burroughs machine, called ClearPath Plus from Unisys (formed from the mergers of Sperry and Univac and Burroughs). Support levels did deteriorate, though—something Gray attributes to industry changes rather than to the merger.

Outsourcing expert Robert E. Zahler, a partner at Washington law firm ShawPittman, says the mainframe market shakeout occurred in an emerging market.

"The Seven Dwarfs weren't stable economically," Zahler says, whereas today's mergers occur in a mature market. Thus, he predicts that J.D. Edwards will disappear within PeopleSoft, whose own products may fade if it is taken over. "The product lines will evolve, and the outlying functions will gradually disappear," he says. And the users will have to learn to like it. —Alan R. Earls

How Content Management Technologies Can Deliver Bottom-Line Results

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Reduce Costs, Improve Productivity and Increase Efficiency Through Enterprise Content Management

Content management technologies have moved beyond their traditional mission to capture and organize data for better access and retrieval. The real benefits of today's content management strategies are reduced costs, improved productivity and collaborative business processes. With the ever-present mandate to improve ROI and lower Total Cost of Ownership (TCO) for IT investments, content management is a win/win for both IT and your organization.

Consider some of your own core business functions such as accounting, human resources, and customer support — chances are, you are still using a combination of paper documents, email, manual searches, and other time-intensive processes. These inefficiencies result in overhead expenses, rework and mistakes — but the good news is that today's content management technologies can make significant operational improvements and provide tangible, bottom-line results.

Automated Processes Integral to Business Management

Large or small, public or private, anywhere in the world... virtually all organizations are driven on some level by the day-to-day processes that support business operations. Today's employees know that their organization depends on their ability to collect, manage and deliver the right information to the right person at the right time. That's why many organizations are implementing automated, integrated content management solutions. With integrated content management, you can achieve gains in three critical areas:

- **Productivity** — Any business function can become more efficient when the data it needs to perform that function is readily accessible and usable. For example, with integrated content management, an accounting staff can better track payables and speed up payment to vendors — ultimately improving the company's credit rating and lowering the overall cost of credit.
- **Efficiency** — With integrated content management, your employees will be able to seamlessly access, retrieve and process electronic data, versus spending time on manual searches or other time-consuming, outdated processes.
- **Compliance** — In most organizations, certain types of data must be retained for many years for auditing and tax purposes. Conversion of paper documents to electronic formats significantly reduces the amount of storage space required for documents — therefore reducing or eliminating your costs for off-site archival storage. And, you can readily access the documents you need in the event of an audit or other enforcement action, speeding resolution.

Selecting a Content Management Solution for Your Accounting Function

To understand the benefits that can accrue from an integrated content management solution, consider the accounts payables (AP) function — a universal business operation.

An integrated content management solution for accounting should include:

- **Electronic repository of all accounting data, with Web-based access to that data**
- **Workflow, or business process capabilities to streamline operations**
- **Integration with other software applications**
- **Secure, accessible storage of electronic data for cost-effective storage and compliance requirements**

An integrated content management solution for AP should include five core capabilities:

- **An electronic repository of all source documents** – Your organization will speed up processing, minimize manual searches and create a valuable repository of data by converting paper documents into an electronic format. This can be done via scanning technologies that should be part of your overall content management solution. Scanning also minimizes the space and overhead associated with files and boxes of paper documents.
- **Browser-based access to accounting data** – A Web interface to your electronic data means your staff can process documents no matter where the data or the staff person resides. As a result, your staff can be productive, regardless of location, time zones and other constraints associated with traditional accounting processes. The AP operations can be done with keystrokes and mouse clicks, not manual searches, faxes, and multiple hardcopies.
- **Workflow, or business process automation capabilities** – Automating specific processes in accordance with your organization's business rules can dramatically improve efficiency. Once a particular step in a process is completed, say matching an invoice to the purchase order in the accounts payables process, the document(s) are automatically forwarded to the appropriate person for the next stop in the process.
- **Integration with existing accounting applications** – The content management solution you select needs to feature open architecture and software development kits to allow for easy integration with your existing applications. This type of integration can enable users to access documents directly from within the accounting application.
- **Data protection** – Finally, no integrated content management solution would be complete without secure, accessible storage and data protection. Look for a data storage and management component that is flexible enough to let you choose the storage media that is best for your organization – including optical, WORM, Tape, DVD and CD, as well as newer disk-based options.

In addition to the above capabilities, be sure to select a content management solution that is backed by a company with the experience, resources and support that you need.

The benefits of applying content management technologies to your organization include:

- **Reduced costs**
- **Improved productivity through fewer manual processes**
- **More efficient use of document and other content that drives day-to-day operations**



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STRATEGIC DIRECTIONS

New Data & Storage Solutions

STRATEGIES FOR EFFECTIVE
DATA AND STORAGE MANAGEMENT

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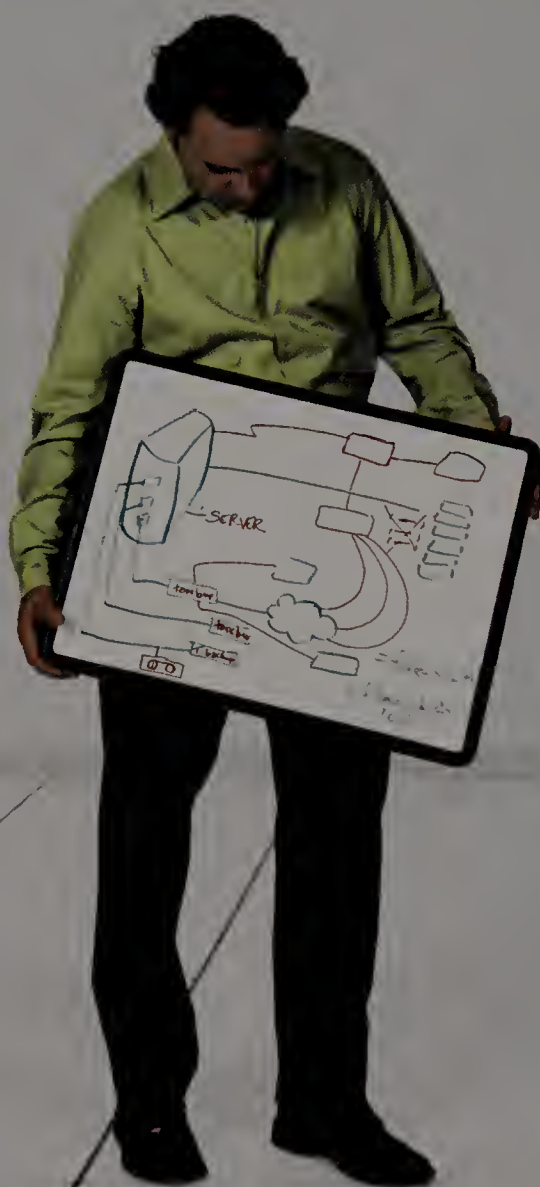
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I can't pull all-nighters every night.

Thing is, our backup and recovery system has to.

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Not even for a second.

Not if I hope to get some myself.

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 **STORAGETEK®** Save the Day.™

STORAGE SOLUTIONS: SAVE THIS EDITION

BY TOM FIELD

While on the topic of storage, let me give you a piece of sound advice: hold onto this particular *Strategic Directions* edition. Get extra copies if you have to, and lock some away in a safe place for later retrieval and reference. Whatever you do, don't let this issue fall into the desktop pile of to-be-reads that never gets read.

Because of all the key topics we could be exploring (and, hey, in the *Strategic Directions* series, they're all key topics), none is any more front-and-center and of-the-moment than data storage and management.

Excuse me. Make that "Data and

Storage Solutions" because, really, that's what we're here to discuss: new ways to tackle the ever-growing problem of storing and securing all this vital data we collect.

At a time when *CIO Magazine's* annual "State of the CIO" survey reveals integration, cost-reduction, alignment and security as the top four priorities challenging IT leaders, storage cuts to the heart of each of them. In this age of electronic commerce, data is the coin of the realm. Integrating and securing this data in the most cost-efficient, business-driven manner possible—that's the task entrusted to IT leaders. And it's the mission of this

critical *Strategic Directions* edition to offer new strategies and solutions on such core topics as:

- Taking stock of information assets;
- Maximizing data investment;
- Dealing with unstructured data;
- Storage management technologies and techniques;
- The ROI of data management.

By no means is this *Strategic Directions* edition the last word on storage management, but I'd like to think it furthers the conversation greatly.

About *Strategic Directions*: As you know, *Strategic Directions* is the ongoing series of *CIO Magazine* supplements, produced by *CIO's* Custom Publishing group, focusing on the key business-critical technologies and solutions of the day. Through research, analysis, case studies and vendor profiles, *Strategic Directions* provides an executive-level primer to the hot topics on the minds of senior IT and business leaders.

Please let us know what you think—about *Strategic Directions* in general, this edition in particular, and ideas you'd like us to tackle in future editions. Got any storage management best-practices you'd like to share with other IT/business leaders? Send them to me; I'll pass them along in our next issue.

Thanks for reading *Strategic Directions*. And thanks in advance for writing in with your feedback.

Tom Field
Director of Content Development
CXO Media Custom Publishing
Tfield@cxo.com

READER FORUM

To the Editor:

This issue on Security takes home the trophy. In fact, you could do all four issues this year on the changing face of security in technology—the corporate environment includes all forms of tech innovation from PDA and tablet PC to cell phone hybrid with internet access. I'm particularly interested in the vulnerabilities of satellite connections and extended range wi-fi (from 7 miles to 30 miles).

It's a winner. Congrats. I'm using it rather than just reading it with interest as with most other *CIO* issues.

Dick Bouslough
IS Dir
Forest Home Inc.

To the Editor:

Just catching up on my reading and caught your article on Outsourcing in the *Strategic Directions* series in the June 15 *CIO* magazine. The tips in the article are right in line with my thinking and our experience managing a \$1 billion outsourcing deal with Unisys Corp. as our partner. Particularly liked the line about outsourcing being an engagement – "...for it to succeed then parties on both sides of the deal have to remain fully engaged".

Keep up the good work!
Pat Schambach
Assistant Administrator and CIO
Transportation Security Administration
U.S. Department of Homeland Security

INFORMATION: GETTING ALL YOU CAN FROM YOUR MOST IMPORTANT ASSET

“Extracting more value from existing resources, in particular data and storage assets, is a top-of-mind challenge for CIOs,” says Guido Sacchi, chief information officer of credit card provider CompuCredit.

To make it happen, you have to pull more value from your existing IT infrastructure and stretch legacy technologies and applications to fit new demands.

“The first step for IT departments

What will it take? Here’s the short list:

■ **OWN YOUR STRATEGY AND YOUR ARCHITECTURE.** It’s critical for CIOs to demonstrate leadership so that precious budget dollars are not spent in unnecessary investments, says Sacchi. “Engage vendors in implementing an effective architectural design driven by the company’s business model and demand for informational assets. CIOs should implement what they have designed and be the owners of critical business knowledge, as opposed to abdicating this responsibility to vendors.”

criticality of informational assets. This approach has inspired a deep understanding of data criticality at CompuCredit and has led to more than \$500,000 worth of freed-up capacity in just the first six months of the new strategy’s execution. As a result, CompuCredit completed an acquisition without additional capital investments in storage resources.

■ **KEEP IN MIND DATA, STORAGE AND BUSINESS CONTINUITY POLICIES.** “Every organization should have at least minimal policies relating to retention and expiration of files on online, near-line and offline storage systems,” explains Hernan Alvarez, vice president of infrastructure at the mobile-media company Mobliss, Inc. “Nearly every element should be included.” Important ones include data lifecycle and recovery priority. The data management plan needs to be tightly integrated with any disaster recovery plan. As the business grows, the data management plan will change, and disaster recovery needs to follow. If the two are out of sync, mean time to recovery will be greater than the business can withstand without unacceptable cost, and data loss may occur.

“EXTRACTING MORE VALUE FROM EXISTING RESOURCES, IN PARTICULAR DATA AND STORAGE ASSETS, IS A TOP-OF-MIND CHALLENGE FOR CIOs.”

— GUIDO SACCHI, CIO, COMPUCREDIT

should be to devise a clear strategy for informational assets, focused on architecture,” Sacchi says. “Architectural design is the key to unlocking value, and it helps the organization define where true business value resides and what can be considered a ‘utility’.”

■ **APPLY ASSET MANAGEMENT PRINCIPLES.** “It’s striking that many people talk about data as an asset yet forget to apply fundamental asset management principles,” says Sacchi. For example, one of the main tasks for IT departments should be to understand the

■ CONSOLIDATE INFORMATION RESOURCES.

Decision makers can't get an enterprise-wide view of the business if vital information is scattered and difficult to obtain. Sometimes consolidation means integrating physical resources—data, applications—and revamping business processes. Sometimes it means re-architecting infrastructure. Sometimes it means virtualization. For many organizations, consolidation means upping the ante when it comes to managing data, which must be synchronized, transformed and integrated from multiple systems. Such integrated data may reside in a virtual database, a very large centralized database or a distributed, networked system based on Web services standards like XML (extensible markup language).

■ INVEST IN STRUCTURED AND UNSTRUCTURED DATA MANAGEMENT.

Data management investments can boost productivity, make customer-satisfaction work more valuable and efficient, and institute a single, topside view of the business. The challenge: keeping databases manageable as they grow to petabyte-plus sizes while responding to a push for zero-latency business processes as well. It can be accomplished with increasingly sophisticated database design and management tools, as well as ubiquitous standards and faster interconnections that can move data quickly among a multitude of legacy systems. Getting the most out of all corporate resources also means finding more fruitful ways to exploit the knowledge contained in the vast amounts of unstructured data (documents, for example) that every organization produces. IT has to boost end users' ability to access that data—through portals, which serve as a standard interface that may be centrally managed, and new kinds of search capabilities. Of course, all this data must be stored efficiently and safely even as data

“THE AMOUNT OF UNSTRUCTURED DATA IN ORGANIZATIONS IS NOW SIGNIFICANTLY LARGER THAN THE AMOUNT OF STRUCTURED DATA.”

—BILL RUH, SR. VP, PROFESSIONAL SERVICES, SOFTWARE AG

volumes continue to explode. Storage networking, consolidation and resource management solutions that exploit open standards to ease administrative costs and infrastructure complexity are among the answers many organizations are exploring.

■ DON'T FORGET ABOUT SECURITY.

“Often, a database is secured very well, but an extract or backup copy has very little security,” notes Bob Venable, manager of enterprise systems at Blue Cross and Blue Shield of Tennessee. “We need to keep up, so we need security that follows data and ways to identify what's inside a file.”

■ **MAKE IT A UTILITY.** The ability to fine-tune IT resources in immediate response to changing business conditions can lower costs and save time. The idea is to model the corporate IT function after a utility: services are delivered transparently, without interruption, so end users can focus on the business task at hand rather than the twists and turns of technology. Utility computing empowers IT departments to offer usage-based chargebacks. Different user needs are met with varying levels of service and availability that can be formalized with service-level agreements. The resulting accountability means that IT can more efficiently allocate assets and control costs, track changing user needs with greater precision, and fashion and exploit a more flexible infrastructure with better-planned hardware and software deployments. It

can also align itself more closely with the goals of individual business units and the company overall.

■ REDUCE THE COSTS OF TECHNOLOGY OWNERSHIP.

As more information technologies become commoditized, it's critical to distinguish between IT activities that are a necessary cost of doing business and those that can induce strategic leverage. “Remember to count in problem diagnosis and resolution,” says Venable. “Finding a problem can take a lot of time and will be put off by busy people, resulting in downtime that's possibly longer and more costly than paying to avoid the problem on the front end.” Ways to trim the costs of nonstrategic technologies include:

- **Componentization.** Breaking up enterprise application suites into smaller, more easily digestible pieces that are implemented gradually in stages can generate a more granular return on investment (ROI).
- **Standardization.** Open standards in data management and storage networking can ease the struggle to integrate data and applications, and transport data between incompatible platforms.
- **Outsourcing.** Non-core business functions, such as payroll or purchasing non-production goods, can be handed off to specialists who do it for less than you can.
- **Bundling services.** Negotiating service contracts as part of other purchases can save you, well, a bundle. **SD**

DATA MANAGEMENT IN A ZERO-LATENCY WORLD

The value of the topside perspective—the famous 360-degree view of the customer, the enterprise-wide view of the business—is undisputed. But generally, a topside view requires lots of data from many sources, and putting it all together is hindered by a lack of standards and databases designed for single-shot operational functions. Meanwhile, mixed-workload environments that combine operational as well as analytic and decision-support functions strain legacy systems that few can afford to abandon.

Thus, two issues rise to the fore in data management: integration and scalability.

Integration is the merging, cleansing and standardization of data and/or the integration of data silos. This is part of a larger movement toward enterprise integration that will be implemented with several kinds of solutions. According to the research firm Gartner, enterprise integration now consumes about 35 percent of total IT spending, as solutions move toward what Gartner calls the “service-oriented architecture”—IT infrastructure functionality exposed as services accessed through well-documented interfaces, and business data and logic shared among multiple applications, enabling reuse of services and relieving developers of the need to handle back-end implementation minutiae.

Scalability means ensuring that hardware, software and networks can reliably and efficiently deal with increasing

amounts of data and quickly evolving business demands. Developments in hardware are making it easier to scale databases to the burgeoning needs of end users. Commodity systems arrayed in a rack of “blades” can be amassed by the tens, or by the thousands, rivaling the power of symmetric multiprocessors but at less cost. And networked storage—notably storage area networks, with or without links to network attached storage—makes possible the centralized management of stored data independent of the systems and applications that access them.

“Most database environments will grow way in excess of what anyone thought they would at the time of original design and purchase,” says Bob Venable, manager of enterprise systems at Blue Cross and Blue Shield of Tennessee. “When it comes to scalability, think in terms of total edge-to-edge performance, from the enter key on end-user PCs to Ethernet communications lines to servers to disk. Remember, it’s about true end-to-end performance.”

IT'S ABOUT THE BUSINESS

Driving data integration is a mounting need to deliver unto decision makers the best possible information to do their jobs.

“No data is standalone anymore,” Venable says. “Almost everyone has overlapping business processes that share data. Avoiding data duplication and accidental old data copy utilization is important.”

This means bringing together data from multiple, often incompatible applications, legacy systems, enterprise resource

planning (ERP) systems, flat files and more. Gartner estimates that migrating legacy data sources can eat up more than 20 times the effort and resources required to deploy an ERP application.

Data integration can be about some or all of these:

- *Extract, transform and load (ETL) functions* that pull information from databases
- *Enterprise application integration (EAI) tools* that allow applications to interact and pool data across platform environments
- *Web services* that permit one app to extract and manipulate data from another.

DOING THE DIRTY WORK

Key to data integration is clean, usable data. The Data Warehousing Institute estimates that poor data quality costs U.S. businesses more than \$600 billion a year in printing, postage and staff overhead, among other expenses. Analysts at Gartner expect that over the next three years, at least 50 percent of data warehouse projects will fail to achieve their desired results due to data quality problems.

Data cleansing tools, which integrate with ERP, CRM and other business intelligence solutions, clean up mailing lists or customer databases by searching for and correcting duplicate or incorrect addresses, for instance, or checking for misspellings or spelling variations. They can identify miscategorized data and apply customizable rules to ensure that the data entered is appropriate.



Bob was
drowning in
email compliance
issues.

Now he's
breathing
easier.

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You need an efficient way to manage risk. LEGATO's EmailXtender® suite simplifies email compliance. It captures, organizes, archives and provides immediate access to email and instant messages. So you can keep your head above water when it comes to compliance issues. **Problem Solved.**

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DATA AND STORAGE SOLUTIONS | DATA MANAGEMENT

ETL TODAY

From their beginnings extracting relational data, transforming it into a standard format and loading it into a data warehouse, ETL tools have evolved into instruments of data integration, pulling data from operational systems and all manner of applications. To combat such challenges as overwhelming data volumes, poor data quality, incompatible metadata management schemes and slow data transformation rates, vendors like Ascential offer integration suites that take on not just ETL chores but also data profiling, metadata management and data quality.

ETL products can also help organizations do data integration on the fly, supporting multiple data formats along the way. Uniboard, a Canadian manufacturer, expects to save \$200,000 over the next two years using XML Global

Technologies' GoXML Transform, which maps between complex formats such as EDI, X12, HIPAA, SWIFT and XML without custom coding.

UNTANGLING APPLICATION SPAGHETTI: ENTERPRISE APPLICATION INTEGRATION

Too often, changing business conditions force organizations to enhance their IT infrastructures by means of standalone applications that were not designed to be integrated with any other systems. In order to share information throughout the enterprise, they typically turn to customized interfaces that allow for point-to-point integration—and in the process end up with application spaghetti, a tangle of interfaces.

To untangle the mess, enterprise application integration (EAI) systems use generic mechanisms and well-defined

interfaces to connect existing applications and leverage multiple systems, generating a consolidated view of data. Because they're strategic initiatives, EAI typically involves designing an enterprise-wide framework that incorporates process definitions and business process reengineering and that embraces existing and future systems.

northAmerican Logistics (nAL), for example, claims it saved more than \$1.5 million over four years using Software AG's integration server, EntireX, to build a fully automated supply chain that processes all data exchanged with customers and partners via XML. Order-processing costs and expenses for the maintenance and development of its IT architecture were reduced as well. In fact, nAL estimates that for every \$1 invested in EntireX, it achieved a net benefit of \$5.49.

CASE STUDY

COMPUCREDIT'S ENTERPRISE DATA ARCHITECTURE SOLVES APPLICATION INTEGRATION AND INTEROPERABILITY, DRIVES SUCCESS



highly-successful direct marketer of branded credit cards and fee-based products, CompuCredit's competitive advantage is based on the sophistication of its analytical techniques, risk and decisioning models—especially the acquisition and servicing of credit card receivables portfolios.

Not surprisingly, the delivery of quality information—on-demand—is critical to the success of CompuCredit's 1,500 employees. So when CompuCredit's forward-thinking CIO, Guido Sacchi, realized soon after joining the firm that CompuCredit's underlying IT infrastructure—particularly its data architecture—was in need of a serious overhaul, he took up the challenge and began the process of building an enterprise data architecture that would enable and sustain the firm's successful business model.

XML GATEWAY: KEY TO SMOOTH FLOWING DATA

After evaluating a number of design alternatives, says Sacchi, CompuCredit decided open standards, an XML architecture and an investment in web services would be the best way to achieve its goal of a truly supportive enterprise data architecture that solves the problem of enterprise application integration and interoperability. CompuCredit next choose Software AG as its technology partner for the project.

"We shopped around, but only Software AG could pull together these three critical elements: open standards, an XML architecture and web

services," he says. "Software AG had the mature tool sets, experience and vision we needed—and their ability to transfer knowledge has helped us to enhance our own in-house capabilities."

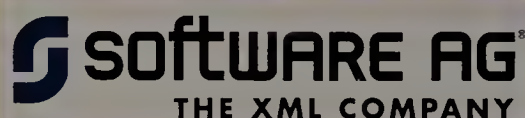
With Software AG's help, CompuCredit has designed for itself an enterprise data architecture capable of delivering the complex services needed to meet the challenges of its dynamic business environment. At the core of the flexible and scalable new architecture is an XML Gateway. A doorway through which IT provides web services on-demand to users' desktops, the XML Gateway transparently provides access to CompuCredit's disparate data sources and applications.

ROLLING OUT BOTTOM LINE RESULTS

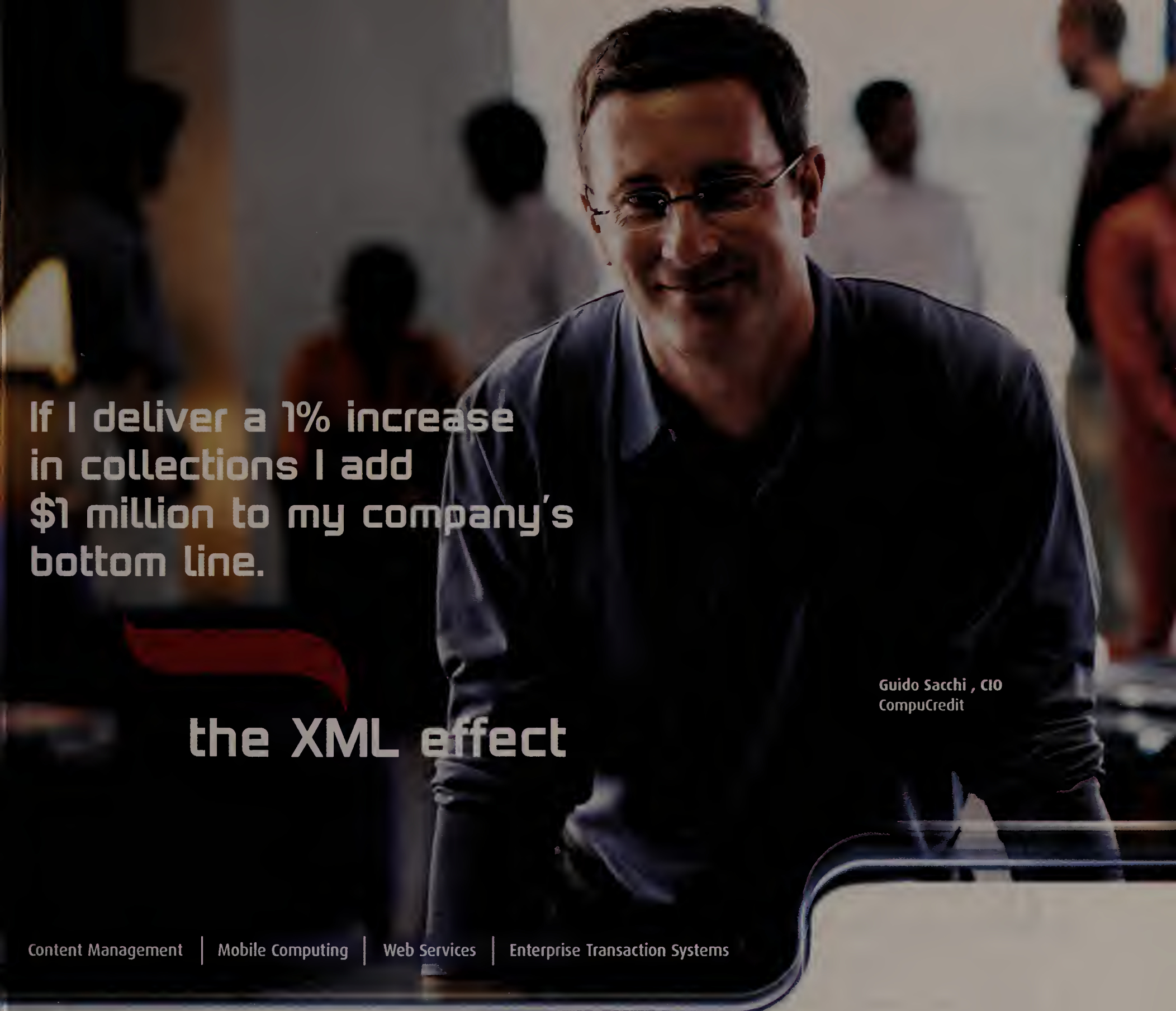
As the time nears for the rollout of the entire new enterprise data architecture into production, the excitement, says Sacchi, is building.

"IT is the foundation that sustains the growth strategy of the company," he says, "buying us the right to play at the deal table with an advantage over our competitors. And it allows us to acquire and manage portfolios more effectively—if I can deliver a one percent increase for our collections, I'll add \$1 million on the bottom line. That's big," adds Sacchi.

Agreed.



For more information contact Gerda Yearwood of Software AG, Inc. at 703-391-8295 or gerda.yearwood@softwareagusa.com



If I deliver a 1% increase
in collections I add
\$1 million to my company's
bottom line.

the XML effect

Guido Sacchi, CIO
CompuCredit

Content Management | Mobile Computing | Web Services | Enterprise Transaction Systems

CompuCredit's robust growth strategy requires on-demand delivery of quality information to more efficiently acquire and manage credit card portfolios.

That's why CIO Guido Sacchi took on the challenge to reduce the time to service new portfolios from months to weeks with the XML Business Gateway.

Imagine delivering to the business user's desktop a single view of information from disparate data sources, risk models and collections applications – right when they need it.

Imagine transforming data locked into complex systems into real intelligence that propels the business forward.

Imagine working with a partner who has over 30 years experience in data management including the early shaping and development of XML.

Guido did. And now both he and CompuCredit are seeing imagination turn to reality.

Discover the XML Effect.

To learn more about Software AG and how the XML effect can help you unlock data assets, visit www.softwareagusa.com today.

 **SOFTWARE AG**
THE XML COMPANY

DATA AND STORAGE SOLUTIONS | DATA MANAGEMENT

Likewise, when equipment manufacturer John Deere undertook a large-scale implementation of SAP's R/3 ERP solution, it also needed a way to interface—in real time—with a complicated legacy environment. Mercator's Inside Integrator did the trick, cutting the costs of legacy data conversion and other integration tasks by as much as 80 percent.

DATA INTEGRATION WITH EAI

EAI manages a host of tasks, providing user interaction mechanisms and Web server- or application server-hosted business logic that integrates apps, business processes and legacy systems. But its real focus is data integration. By connecting diverse databases in different locations, an EAI hub—which includes data transformation and messaging components—offers a consolidated view of business

information. The hub transports data reliably and securely between databases in a consistent, repeatable way.

Data manipulation is directed by an EAI solution's connectors (based on database triggers, event-driven, etc.), creating a layer of abstraction that makes enhancements and maintenance easier.

There are several implementation options for EAI:

■ *Buy it.* Database-to-application capabilities are available from Software AG, IBM, Oracle, Sybase, Computer Associates, Microsoft and Sun Microsystems. EAI tools are sold by BEA Systems, Mercator, SeeBeyond Technology, TIBCO, Vitria and webMethods.

■ *Build it (quickly).* Perhaps better suited to shorter-term projects focusing on data integration and targeting a few key applications; thus, the number of processes and techniques to be

addressed is more manageable than with some large-scale projects.

■ *Leverage what you've got.* Instead of investing in a new architecture, expand your application server functionality with solutions like IBM's WebSphere or BEA's WebLogic.

COME TOGETHER: XML AND WEB SERVICES

While Web services pretty much remain a pipedream, a lot of the parts needed to pull off production applications are coming together.

■ Vendors have heartily embraced XML, the key enabling standard. Relational database manufacturers are adding XML data-handling capabilities, and business giants like Wal-Mart are insisting on XML format for invoices and the like. While the bulk of enterprise data resides in file systems rather than in relational

NEW SOLUTION

LONG & FOSTER FINDS CONSOLIDATION SAVINGS WITH COMMVAULT



The throughput we're getting with Commvault's Backup and Recovery software has been very impressive," says Chris Saben, network architect at real estate services provider, Long & Foster. "More importantly, it's given us the comfort level we needed to go forward with our storage consolidation plans."

As Saben sees it, confidence in consolidating is quickly lost if you can't restore rapidly. But since integrating Commvault's Backup and Recovery software for Microsoft Exchange into its newly installed 23 terabyte SAN, Long & Foster's throughput performance has surged from 22 gigabytes an hour to 48 gigabytes an hour—reducing backup and restore time frames considerably and opening the door for storage consolidation.

"Capturing our primary backups onto the SAN means we can stop using so many tapes," explains Saben. "By backing up to the SAN first, we're reducing our backup windows, allowing us to back up more servers in less amount of time. Then during the day, those backups are moved off the SAN into our large tape library for both long term and off-site storage."

BIGGER DATABASES YIELD SMALLER COSTS

Moreover, with a restore time of 48 gigabytes per hour, Long & Foster can now comfortably put larger Exchange databases on its servers and, for example, cut the number of Exchange servers needed to handle its mailboxes from ten to three.

"It's the difference between spending \$60,000 versus \$200,000 on servers—that's a huge savings. The combination of Commvault's

QiNetix data management tools and our SAN enables us to realign our assets, to better meet our future needs without forcing us to make large expenditures in infrastructure," notes Saben.

In addition to the big benefits of high throughput, CommVault's decision to drive its solution off an SQL engine, says Saben, delivers a more robust database and its use of Windows drivers means Long & Foster can adapt quickly to new backup technologies.

Saben also credits CommVault Support with the ability to take "ownership" of a problem and anticipates deploying QiNetix software to solve other data management issues. In fact, Long & Foster already have plans to use QiNetix DataMigrator software to make archived data rapidly accessible.

"The combination of Commvault's QiNetix data management tools and our SAN enables us to realign our assets, to better meet our future needs without forcing us to make large expenditures in infrastructure," he adds.

Long & Foster CIO Michael Koval is also highly impressed with the benefits of CommVault's Backup and Recovery software.

"Long & Foster provides the most robust IS support in the real estate business, and Commvault offers a substantial value proposition, in terms of performance and cost, that helps Long & Foster to maintain its lead in the industry," he says.

**CommVault
Systems**

For more information on Commvault QiNetix enterprise data management solutions for Windows, UNIX, Linux and Netware platforms, visit www.commvault.com.

databases, hybrid SQL/XML databases signal that business documents will no longer be beyond the reach of SQL-based querying and analysis.

■ The two competing infrastructures—J2EE (available on application servers from IBM, Oracle, Sun Microsystems, Sybase and BEA) and Microsoft's .NET—can now furnish the back-end conduits that connect Web services component architectures.

■ New standards supporting a range of business processes across diverse systems and database environments are emerging: BPEL4WS (Business Process Executive Language for Web Services), WS-TX (Web Services Transactions) and WS-C (Web Services Coordination), as well as initiatives by Web services standards bodies such as XML Digital Signatures and Security Assertion Markup Language (SAML).

■ Standards addressing Web services development will ease data integration challenges. The ANSI SQL/XML standard, for instance, transforms data between XML and SQL formats so that developers can write one XML application that will work across multiple relational databases without specialized knowledge of database vendors' XML extensions.

Some worry that its overhead—text strings rather than binary—make XML transmissions too bulky and slow for real-time applications. Yet for the 85 percent of apps that don't require real-time performance, XML will have an enormous impact as vendors and their customers develop XML-enabled data architectures. Consider Bosch Rexroth, a maker of electric drives and controls and hydraulics. After it turned to Software AG's Tamino XML server to house all product information and integrate databases of images and technical tables, its cross-media publishing tasks—such as catalogs and brochures—became so much more efficient that the system paid for itself in 18 months. **SD**

CONTENT AND DOCUMENT MANAGEMENT: DEALING WITH UNSTRUCTURED DATA

Most of the information that drives the business still resides in non-relational applications. It's unstructured data that cannot be transformed into intelligence using the same tools and techniques that have traditionally worked on structured data.

And there's plenty of it too: At the end of 2001, more than 3 billion documents could be accessed on the public Internet, a volume that, according to

Content management solutions usually accelerate information delivery cycles, permit multiple output channels as well as information personalization and make content easier to locate and use.

Among the capabilities CMSs can spread enterprise-wide:

- Furnish a common interface for all content types, structured, unstructured and image-based;
- Tag metadata via automated document categorization and summarization;

THE VOLUME OF DOCUMENTS ACCESSED ON THE INTERNET IS DOUBLING EVERY EIGHT MONTHS. NO WONDER EMPLOYEES SPEND MORE TIME GATHERING INFORMATION THAN USING IT.

search engine Google, is doubling every eight months. No wonder employees spend more time gathering information than using it.

ENTERPRISE CONTENT MANAGEMENT

The challenge: To enhance the quality and longevity of information that resides in documents, yet keep the content accurate, complete, up-to-date, easy to access and relevant.

This can be accomplished using content management systems (CMS) that handle interactive formatting, content modification and distribution. CMSs use standard, vendor-neutral techniques and separate production and distribution environments.

■ Control document versioning, access and the ability to edit based on job function;

■ Use document workflow rules to ensure accuracy;

■ Establish time limits on how long information stays online and automatically update linked documents after changes.

■ Consider the city of Munich, Germany, whose planners chose Software AG's Tamino XML server and a Web portal to cope with an out-of-control document volume. The server manages document metadata and controls portal communication. With the CMS, document processing times have been cut by between 25 percent and 60 percent. **SD**

DATA AND STORAGE SOLUTIONS | STORAGE MANAGEMENT

STORAGE MANAGEMENT: SOLUTIONS THAT CONSOLIDATE AND AUTOMATE

According to research by the Enterprise Storage Group, a picture is worth about 18,000 words. All those bits and bytes are adding up fast too: the amount organizations are spending on data storage this year is over 100 percent more than they spent in 2001.

Piling on more storage hardware—a tempting proposition as storage hardware costs drop dramatically—only makes storage infrastructures more com-

plex and tougher to manage. Besides, storage utilization levels are so low that more than half of typical host storage is unused. Buy more, waste more.

Still, many enterprises rely on direct-attached storage that can't be shared and is tough to safeguard. For decentralized, heterogeneous IT environments, the costs and hassles—struggles to meet service levels, inconsistent data integrity and security, and rigid infrastructure—are becoming overwhelming in the face of demand for more data, more quickly, more often.

The good news is that there's something a CIO can do about it: consolidate storage resources, a task most effectively accomplished with networked storage.

BEYOND COST CONTAINMENT

For many, bringing rationality to storage woes begins with a simplification and recentralization of storage resources. At a time when data storage is gobbling up more of the budget, consolidating storage can:

■ *Lower system administration overhead. A*

CASE STUDY

RUNNING WITHOUT A STORAGE HICCUP AT MOBLISS

Mobliss, a leading mobile media company, is the workhorse behind the real-time voting and polling which is fast becoming a 'must have' for reality and sports shows.

In 2002 the company expanded the size and scale of its offering linking it to TV for a real-time presence that prompts viewers to "vote" via text messaging.

Not knowing how much traffic it would receive, Mobliss' vice president of infrastructure, Hernan Alvarez, and his team looked for a storage solution that could ramp up quickly.

"We knew success meant finding a fast, reliable, scalable storage solution," says Alvarez. "We looked at a number of alternatives but nothing compared to EMC's CLARiiON CX200—it's simply the best entry-level array out there, period. And it was very, very easy to get up and running—we had a pair of databases talking to that system in minutes and it's been running without a hiccup since."

IN PLACE UP GRADES

One of the major CX200 draws, says Alvarez, is the data-in-place upgrades.

"Not knowing how scalable we will need to be makes the in-place upgrades a key for us," he explains. "The ability to go from a CX200 to a CX400 or CX600

with data-in-place, with very little interruption, is significant. Other vendors can add disk, but that alone does not get you the number of I/Os per second you may need for a fast transactional application like real-time messaging."

CONSOLE COMFORT AND MIXING DRIVES

Alvarez is also pleased with CLARiiON's Navisphere management software, which he says is intuitive and requires little training.

"Navisphere is a great management tool," says Alvarez. "We know what each individual disk is doing and the ability to manage everything about the array from the console is extremely productive."

Mobliss is also looking forward to leveraging ATA drive technology.

"Mixing your high-speed fibre drives with lower speed, high-capacity ATA drives is very attractive; the price per megabyte is so low," notes Alvarez. "We have a lot of storage we don't need at break-neck speeds; but we want it to be there at acceptable speeds, with the same reliability as our high-speed data. The ability to intermix in a single product line is huge; we'll definitely be investing."

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simpler storage infrastructure can mean fewer data centers, less maintenance, trimmed staff costs and reduced licensing fees. After Blue Cross and Blue Shield of Tennessee (BCBST) consolidated its data storage into a single networked environment and implemented a storage area network (SAN), storage expenditures dropped by 60 percent and maintenance costs went down 70 percent. Add in space reduction, staff avoidance costs and productivity improvements, and the savings amount to between \$1.5 million and \$2 million a year.

■ *Boost storage utilization.* Why are storage resources so poorly utilized? Mostly because of inadequate connectivity. Networked storage, which separates data storage from operational servers and makes it available in shared pools to end users via networks, can be dynamically allocated so that less storage space

remains unused. Storage resources of varying types can be added quickly when and where needed—BCBST boosted its storage utilization by 40 percent.

■ *Generate economies of scalability.* When combined with the right management software, networked storage enables an organization's storage infrastructure to scale to the growth of data volumes.

■ *Make data management easier,* even as the amount and complexity of data and its uses continue to grow.

■ *Improve security and business continuity plans.* As compared to labor-intensive, direct-attached storage, consolidated storage solutions with automated backup and high-availability configurations can improve data safety and reliability while requiring less human intervention.

■ *Help align IT infrastructure with business strategy.* Here's your chance to optimize a major chunk of IT infrastructure so it can meet current and future enterprise demands—including legal requirements imposed to maintain data privacy and management standards.

■ *Facilitate resource metering.* Once storage gets provisioned from a central resource, usage can be monitored, measured—and billed.

THE UTILITY OF IT ALL

Many believe all this adds up to utility computing—a rejigging of core data center technologies in order to transform the components of IT infrastructure, like storage, into services for which end users can be charged.

But utility computing can't happen without storage management software.

COMPANY PROFILE

STORAGETEK'S INFORMATION LIFECYCLE MANAGEMENT: NOT ALL INFORMATION IS CREATED EQUAL

In today's demanding times, market conditions are forcing companies to reconsider the ways in which they assign value to their information. Budgets are flat or declining and skilled human resources are scarce, while at the same time, more information is flowing through businesses (at annual growth rates of 50 to 70 percent), and more laws and regulations are mandating how long information must be accessible.

That's why StorageTek, a total storage solutions expert, created its Information Lifecycle Management approach to helping customers more efficiently manage information from its creation to deletion.

For StorageTek, Information Lifecycle Management is more than just words on paper. It's the way the company approaches data storage and solves information management issues with its customers based on two key issues:

- (1) What business decisions must the customers need to make about their information?
- (2) How does the value of information change over time?

ONE SIZE DOES NOT FIT ALL

StorageTek, one of a few companies that provides a full array of solutions to meet the data storage and archiving needs of businesses, understands that not all data is created equal and as data moves through its lifecycle it

must be managed and can be stored on different levels and increasingly cost-efficient technologies.

As a result, StorageTek is successful in the market because it is equipped to offer customers the best solution that addresses their critical information management issues, while its competitors take a "one size fits all" approach by recommending the storage devices they have to sell instead of the technology that best addresses customers' requirements.

STORE, MANAGE, REPLICATE, INTEGRATE

The building blocks of Information Lifecycle Management are store, manage, replicate and integrate. These four elements help organize storage-related activities logically, and assure customers of a proper cost-benefit balance in managing storage.

Not surprisingly, StorageTek's customers are embracing Information Lifecycle Management because it provides them with a solid foundation on which they can build their storage infrastructure as they grow.

Through Information Lifecycle Management, StorageTek helps customers solve pressing strategic business issues, all while lowering the cost and improving the efficiency of their storage operations.



For more information, visit www.storagetek.com

DATA AND STORAGE SOLUTIONS | STORAGE MANAGEMENT

Leading IT infrastructure vendors like IBM, Hewlett-Packard, Veritas, Computer Associates and Sun Microsystems have committed to a vision of utility computing that embraces elements of storage management. As these efforts mature, several kinds of storage management capabilities will be integrated into them:

- *Storage provisioning*, which dynamically deploys and optimizes hardware resources
- *Storage virtualization*, which logically abstracts storage from physical resources
- *Storage policy-based management*, which helps set performance and availability service levels
- *Storage resource management (SRM)*, which features billing, chargeback and capacity management.

STORAGE VIRTUALIZATION

As IT grapples with burgeoning volumes of data and the creeping complexity of storage environments, storage virtualization solutions can offer some relief.

Virtualization creates an abstraction layer that separates the actual physical storage from the representation of storage to the server operating system, portraying data stored in any number of media, devices and locations as being located in one centralized repository. This virtualized pool of enterprise data thus hides storage infrastructure complexities. Everyone—IT staffers as well as end users and their business applications—gets a single, logical view of all the data in the storage pool, allowing them to directly access the information they need wherever it is.

Pooling 70 terabytes of arrayed storage, DataCore Software's virtualization appliance has boosted Conesco Finance Corp.'s storage utilization rates to 85 percent from 55 percent, and the time required to provision storage for new applications has plummeted from four days to just

an hour. The company has saved three times what the DataCore product cost, in part by being able to postpone the purchase of three additional terabytes of storage.

In addition to virtualization vendors like Legato (recently acquired by EMC Corp.) and DataCore, several major players are stepping into the ring, among them IBM, Cisco Systems, Hewlett-Packard and Sun Microsystems.

STORAGE RESOURCES MANAGEMENT

Before data can be migrated to a storage area network (SAN) or a networked area storage (NAS) environment, it needs to be categorized according to such variables as file type, access date, owner and business value. Without this kind of granularity, conceiving effective storage policies—essential to successful storage consolidation projects—is tough to do.

This type of categorization is performed by storage resource management (SRM) tools, which collect information about storage assets, place it in a central repository and, using analytical tools, optimize storage assets and anticipate storage requirements.

Even though SRM tools tend not to initiate actions, they generate significant ROI, since the alternative requires manually analyzing and categorizing enormous volumes of data. Many companies, including Veritas, IBM and Computer Associates, offer SRM products. Integrated with storage policy and virtualization capabilities that allow them to automate service-level management, data path optimization, provisioning and so on, SRM tools will become key to infrastructure management.

To get the most from SRM, look for products that deliver active, policy-based management that permit file-level automation across heterogeneous platforms and initiate corrective actions to help maintain storage asset availability. They should also manage data within mission-critical applications

(such as Microsoft Exchange, SQL Server, Oracle) so you can get a consolidated view of storage assets.

"No organization should be without an SRM solution," says Nancy Marone, senior analyst at Enterprise Storage Group. "These tools provide information on how resources are being utilized, who the users are, and what types of files and data are being stored. SRM solutions can help organizations reclaim wasted space, more effectively utilize their resources and predict when they'll need additional capacity. The solutions aren't too expensive and help reduce total cost of ownership."

SAN MANAGEMENT TOOLS

Highly specialized SAN management tools supply the physical layer of storage management by identifying, configuring, allocating and deploying storage assets in heterogeneous environments.

EMC's Control Center, for instance, features array management, while McData's SANavigator is a fabric manager. Other products, such as Veritas' SAN-Point Control, EMC's VisualSAN and InterSAN's Pathline, are designed to work in heterogeneous environments.

Storage management vendors are working to combine the capabilities of both SRM and SAN tools to optimize storage use in real time, according to established policies and processes. Active storage management tools are being developed by Veritas, EMC, IBM, Hewlett-Packard and Sun Microsystems, among others.

INFORMATION LIFECYCLE MANAGEMENT

Not all data is created equal. Organizations "embrace information lifecycle management because they understand that the value of data changes over time," says Pat Martin, chairman, president and CEO of StorageTek.

The value of data, adds Steve Duplessie, a senior analyst at the

DATA AND STORAGE SOLUTIONS | STORAGE MANAGEMENT

Enterprise Storage Group, “is the one overlooked variable that really screws everything else up. We tend to treat data the same from inception to death, but clearly the value of the data changes over time, and as such should be treated differently.”

Information lifecycle management (ILM) software addresses this problem with the concept of a lifecycle: data is treated uniquely according to its comparative value, and, as that value changes, the level of accessibility and protection it gets is altered dynamically. The result: better quality of service at reduced cost.

Sounds good, but it’s tough to implement in the heterogeneous, networked IT environments that serve many organizations. Many tasks—including the ability to understand data within the context of its file system or application as well as data replication, volume management/virtualization, migration and archiving—must be coordinated across a variety of network, system and storage platforms.

Well-designed data and storage management policies can help, says analyst Steve Kenniston of the Enterprise Storage Group, calling them “the beginning of true information lifecycle management and the ability to monitor data growth better for planning purposes. By managing what data lives where and at what time, you can control how data is protected and increase protection levels.”

THE CHALLENGES

What does it take to make storage consolidation happen?

Security. “There are certain vulnerabilities that are introduced when consolidating and networking data,” says Enterprise Storage Group’s Marrone. “The benefits of consolidation may outweigh the risks, but organizations must perform additional security assessments to make sure data is secure. Data deemed critical to the business should

be protected by more than just an external firewall.” She suggests encryption for “data at rest” so that critical information is not compromised.

Getting everybody together. “The first thing a CIO needs to do,” says Hugh Hale, director of technical services at Blue Cross and Blue Shield of Tennessee (BCBST), “is to make certain all of IT’s various support groups come together and develop one, broad strategy. Convincing all the technical support groups to play together is the biggest challenge.”

Hale advises focusing on each group and getting them to consider potential solutions from an enterprise perspective: What’s the most efficient? What works

best for everyone? For the community?

He also suggests putting the problem and proposed solution to management: Convince company executives that creating a homogeneous environment is so much better in the long run, Hale says.

“I had to explain to them that, yes, while it’s true I could buy a server that is better than the ones we have installed, if you take a look at the total environment, the homogeneous environment is easier to manage, takes the least amount of staff, and we get tremendous vendor support,” he recalls. “We found discussions centering on reliability and availability of the applications very effective in getting executive buy-in.” **SD**

BUSINESS CONTINUITY AND DISASTER RECOVERY: PREVENTING BUSINESS INTERRUPTION

A significant, sustained interruption of enterprise operations or information flow can drive a company right out of business. Adding to the pressure are recently passed laws and initiatives—including the Graham-Leach-Bliley Financial Services Modernization Act, the Healthcare Information Portability and Accountability Act (HIPAA) and the European Data Privacy Directive—that hold organizations responsible when personal data goes astray or corporate information isn’t preserved.

Yet according to the research firm Gartner, fewer than 30 percent of Fortune 2000 companies actually have a full business continuity plan in place. Fortunately, there are more ways than ever to safeguard data and the systems that move and store it.

DEVELOPING A BUSINESS CONTINUITY PLAN

The challenge is to understand your business sufficiently that you can determine which processes it needs to stay alive, and then ascertain all the essentials—physical facilities, employees, skills, training, etc.—necessary to those processes. Some best practices:

Assessing risk: Do you understand your business? To figure out where your organization is vulnerable, you’ll need to assign a project team that consists of IT, security and business unit staff. The team’s job is to identify and prioritize mission-critical business processes and evaluate downtime costs. Their deliverables: conclusions about the costs of downtime for your business, what it’ll take to recover the availability of key processes and what kinds of service availability key applications require.

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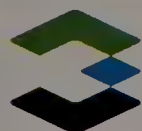
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DATA AND STORAGE SOLUTIONS | DISASTER RECOVERY

Designing business continuity and recovery plans. Repeatable recovery strategies and processes are delineated, including the formalizing of business continuity policies, management, and auditing and creation of crisis management teams and procedures. Service levels should be defined using classification systems that lay out requirements for infrastructure, operations architecture and development endeavors.

Building a business continuity response. As business continuity designs are assembled, detailed plans and routines are formulated for those handling daily operations. Then, as much as possible (since some plans may not be testable), they're tested. And tested. And tested again. This begins an iterative process—ongoing testing results in adjustments to the plan, improving chances of surviving a disaster.

Monitoring and maintenance. Because business requirements are always

changing, business continuity plans must be frequently updated. Part of your business continuity plan design and construction should address procedures for reviewing the plan and making changes as necessary. Testing should be continual—and don't forget staff rehearsals.

Continuity in the culture. If business continuity processes are integrated into every project life-cycle and change management process, then continuity and recovery requirements can be understood and incorporated as new projects and processes are initiated. You'll also need a continuing campaign to improve business continuity policy awareness and management practices across the organization.

TECHNOLOGIES THAT MAKE BUSINESS CONTINUITY PLANNING EASIER

To provide true continuity for critical business processes, not just critical data, companies must:

- Maintain a variety of redundancies dedicated to business continuity, including redundant network capacity, electrical supplies from different power grids and offsite location of failover gear
- Assure immediate availability of adequate latent capacity to sustain rapid failover and recovery
- Find ways to test capacity availability without disrupting current operations.

Among the technologies that make these efforts easier:

High-availability solutions that enable organizations to recover in minutes rather than days. 3PARdata's storage servers, for instance, combine hardware and software fault tolerance so software can be upgraded online, and are scalable from entry-level installations to large, centralized systems.

Distributed applications architectures in which applications architectures inhabit several active physical sites so

COMPANY PROFILE

UTILITY COMPUTING FROM A STORAGE PERSPECTIVE

IT departments today are under pressure to provide ever-higher levels of service while reducing operational and infrastructure costs. To meet these challenges, more and more IT departments are shifting to a utility model that delivers computing power and storage capacity from shared, centralized resources.

NEW TOOLS AND CAPABILITIES

Managing the utility model requires new tools and capabilities. With the VERITAS one-source SRM solution, IT professionals can facilitate the transition to utility computing from a storage perspective.

The VERITAS SRM solution provides storage management from three integrated products: VERITAS SANPoint Control covers physical storage management; VERITAS Storage Reporter takes care of logical storage management; and VERITAS Service Manager for Storage performs business management functions.

•VERITAS SANPoint Control provides centralized, proactive management of the storage infrastructure. Seamlessly integrating policy and performance management, storage provisioning, and zoning capabilities, VERITAS

SANPoint Control simplifies the complex tasks of managing and monitoring a multi-vendor networked storage environment.

•VERITAS Storage Reporter enables IT organizations to know exactly what users, applications or file types are consuming valuable storage space. With Storage Reporter, IT managers get a complete view into the usage of storage across the enterprise, allowing them to raise storage utilization rates to the point where they quickly recover their software investment.

•VERITAS Service Manager for Storage helps organizations align IT strategies with business priorities. VERITAS Service Manager allows IT to centrally manage delivery of IT storage services and quantify the results of expenditures by providing complete business-level reporting of storage utilization, costs, and service-level delivery.

The VERITAS SRM Suite is the one-source solution for IT departments seeking the most reliable and economical way to meet storage and availability requirements.



For more information about utility computing from a storage perspective, visit www.veritas.com

that if one center goes down the others can still process application requests.

Load balancing across multiple physical sites (generally for non-transactional apps) and hot standby, a redundant application environment that's available when an outage hits the primary physical site, for transaction applications alleviate the complexity of multiple-site design and ease conflict resolution. This reduces complexity and improves the chances for conflict resolution. For hot-standby and load-balanced sites, data is often replicated between sites via mirroring or shadowing (at the transaction or data level).

Data replication—notably mirroring and shadowing—are used often with load-balanced and hot-standby sites, replicating databases and file systems. Point-in-time replicas synchronize backup and recovery across multiple systems.

Clustering, which replicates data between sites, monitors site availability and responds to outages by conducting automated recovery at the alternative site.

Snapshots capture, well, snapshots of data. EMC Corp.'s Snap, which works with the firm's Symmetrix DMX networked storage products, generates pointer-based snapshots of production data volumes.

Storage management software delivers the ability to move files quickly and recover even the largest data files in minutes. StorageTek's Application Storage Manager, for example, exploits storage virtualization and automates data management and retrieval across the storage hierarchy via user-defined data policies.

DTS Software's Storage Control Center is comprised of an integrated suite of storage management programs that handle backup, debugging, utilization monitoring, disk space recovery, and DASD and tape management.

Rorke Data's global namespace management applications allow clients to

WHERE THE PAYBACKS ARE: THE ROI OF STORAGE SOLUTIONS

Here are Some of the Results Companies Have Used to Support Their Business Cases:

When COPIC Insurance was moving from a mainframe to an Oracle platform, it needed to migrate lots of legacy data but lacked the SQL experience needed to do so. Using Informatica's data integration platform, the migration was finished in nine months (vs. the usual two years) with just two developers, and one migration project saw cost savings of 50 percent. What's more, COPIC's data warehouse maintenance and support costs are significantly lower and it's easier to train developers.

Brokerage house Legg Mason used Legato's DiskXtender and ApplicationXtender to create a cost-effective data management solution capable of handling massive amounts of data. Working in conjunction with Legg Mason's corporate intranet, the solution has virtually eliminated the company's need for paper report delivery and storage and reduced the time necessary to retrieve client documentation from hours (sometimes days) to seconds.

Implementing StorageTek's Virtual Storage Manager helped soy sauce maker Kikkoman reduce the 1,500 magnetic tapes required to record its mission-critical data to just 500 tapes—a savings of about 67 percent.

One of the largest suppliers of products and services to the global semiconductor industry, Applied Materials, realized a \$2 million savings in storage costs in the first year after implementing OuterBay's LiveArchive software—and has saved \$1 million in storage costs every year since. Applied Materials was also able to reduce database growth rate from 156 gigabytes to 16 gigabytes a year—an annual growth rate reduction of 90 percent.

Application services provider USInternetworking, Inc. (USI), reports getting four to five times better backup speed with Veritas NetBackup DataCenter compared to its previous solution. USI is also able to restore any server or packaged application completely from the ground up. **SD**

access files without knowing their location. Administrators can aggregate file storage across heterogeneous, geographically distributed storage devices, and view and manage it as a single file system.

Vendors are also working together to create comprehensive business continuity solutions. For instance, EMC has joined with Legato and Nortel Networks to offer a solution that allows disparate data centers to behave as one. In event of an outage, transactions are automatically rerouted to an alternate site without requiring restore or restart procedures.

BlueStar Solutions, a provider of hosted enterprise-class applications, is using Veritas' Volume Replicator to shrink data loss to no more than 15 minutes (with a guarantee that the data is consistent and applications can be

brought back up). BlueStar has also reduced downtime to only 10 minutes from start to systems recovery in its alternate data center using Veritas' Global Cluster Manager.

Innovation Data Processing's enterprise storage management software has helped M&T Bank's enterprise storage department take on backup tasks without needing dedicated tape drives to do it.

Unified enterprise data management solutions ensure high-performance data protection, universal availability and simplified management of complex storage networks. The CommVault software platform, for instance, integrates backup and recovery, data migration, data high availability and storage management software. **SD**

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On the Move

By Meridith Levinson

Deasy Sees Opportunity at Troubled Tyco

AFTER THREE AND a half years of tireless politicking, relationship building and air travel, Dana Deasy felt he had accomplished what he had set out to do. As vice president and corporate CIO of the Americas for Siemens, Deasy had aligned the company's 15 North American CIOs around a global IT strategy. Now, Deasy felt, he had effectively become the "Maytag repairman of Siemens." (Read more about his work at Siemens in "The World According to Deasy," www.cio.com/printlinks.)

So when he received a call in May from a recruiter with Russell Reynolds Associates while waiting for yet another flight, Deasy was poised to hear the recruiter's pitch to become a company's first-ever global CIO—even though that company was Tyco, the embattled conglomerate whose former executives have been in hot water for allegedly cooking its books. "I had accomplished just about all the goals I had set out to accomplish when I set up the CIO organization at Siemens," Deasy told CIO just before he joined Tyco in July.

"Tyco presented one of those irresistible opportunities that many CIOs look for," he adds. "It's not too often you get to go into a

\$36 billion company that's never had a global CIO and get to establish the [CIO] organization from the ground floor up." Among the reasons why Deasy found Tyco an "irresistible" opportunity:

- **Personal growth potential.**

Deasy served as a regional CIO at Siemens. Now he had the chance to join the ranks of global CIOs and extend his authority.

- **A greenfield.** The global CIO position was a new one at Tyco, so Deasy wouldn't be stepping into someone else's shoes—inheriting someone else's baggage, processes or ways of doing things.

- **A new management team.** Deasy was attracted to Tyco's fresh blood and high energy at the top, including a new CEO and new CFO. Many other execs had been in their positions for less than a year when Deasy joined in July.

- **Direct line to the CEO.** Reporting to Chairman and CEO Ed Breen, Deasy can have a direct impact on shaping the company's strategic direction and operations at a time when Tyco is trying to reclaim its credibility with shareholders and Wall Street.

- **Familiar organizational turf.** Deasy says he would be able to apply what he learned



DANA DEASY

Dana Deasy's Résumé

CURRENT POSITION

Senior Vice President and CIO, Tyco International Ltd.

WORK EXPERIENCE

- October 1999-July 2003 Vice President and CIO of the Americas, Siemens Corp.
- June 1997-September 1999 CIO, General Motors Corp.'s Locomotive Group
- December 1994-May 1997 Director of Information Systems, Invetech Co.
- June 1981-November 1994 Director of Information Management, supporting Rockwell's Space Shuttle program, Rockwell Space Systems Division

EDUCATION

MBA from National University, San Diego
BS in Business Administration from the University of Southern California, Los Angeles

at Siemens (like building an esprit de corps among a geographically dispersed group of executives) to Tyco because the two global manufacturers share similar decentralized structures.

Deasy's overarching goal: Help Tyco's senior management get the company back on track. He plans to do so by creating a unified IT strategy for the company that all the regional and divisional CIOs buy into, by restructuring IT contracts with vendors and by consolidating IT operations where possible to save costs.

Shawn Banerji, the recruiter who tapped Deasy for the global CIO position, says Deasy's comportment makes him a perfect fit for the new Tyco as does his ability to influence others, which he demonstrated at Siemens and which will come in handy as he tries to unify Tyco's disparate IT organizations. "He's authoritative and very credible, but he's not a snob," says Banerji of Deasy. "He's very inclusive. You've got to have that at a place like Tyco. His ability to influence others and get their buy-in and mindshare is incredibly important."

NEWS OF OTHER MOVES

More CIOs are taking operations and administrative posts. **Thomas A. Lesica**, former CIO at J. Crew and Pepsi-Cola, is now group vice president of global IT and business operations for **Avaya**. **Eric Berg**, former Goodyear Tire & Rubber CIO, became **NCR**'s first chief administration officer. **Rudolph Huber**, vice president and CIO at **Alcoa**, in July became vice president of Alcoa Global Business Services and CIO. **Peter F. Longo**, a certified public accountant and former vice president and CIO for Pratt & Whitney, is CFO of **Sikorsky Aircraft**. For more job changes, see our updated "Movers & Shakers" column at www2.cio.com/movers.



Eric Berg



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OFFSHORE OUTSOURCING

All Global Politics Is Local



MATTHEW SLAUGHTER, coauthor of *Globalization and the Perceptions of American Workers*, is an associate professor of business administration at Dartmouth College. *CIO* Executive Editor Christopher Koch recently sat down with Slaughter to discuss globalization, technology and IT jobs.

CIO: You've studied American opinion on globalization for years and found that most Americans don't support globalization if it will affect jobs in the United States. How does that translate into political support for economic policies?

Matthew Slaughter: There is a real schism between what people think of globalization and what they think of technology. People understand that to get the gains from technology innovation, you have to accept some job loss. But what's striking is that if you have the same sorts of survey questions and replace "technology innovation" with things such as "trade" and "foreign direct investment," people's opinions are almost completely flipped around. The majority of Americans support the churning in the process of technology innovation; and the same majority of people oppose those same sorts of dynamic forces from globalization.

If you look back at the last big labor transition, between farm work and manufacturing, the transition seems to have fewer financial repercussions than the shift of white-collar work offshore that we're seeing today. The farmers were not investing huge sums of money in their children's education and were not gathering years of specialization in a particular job to see that job displaced, followed by a substantial loss of income.

Those sentiments are real, and they are important in terms of thinking about what I should do for myself and for my kids and how I should vote. Mechanization in agriculture meant you just didn't need all those people working on the

farms. It's the same thing today. Why should I spend all this money on college education when I don't know if my children might have a job when they graduate? The sentiments are always present in a market economy where you have this churning going on. They are heightened in recent years, particularly in IT, because these processes have become much more a part of how business gets done.

In the past, the low-skilled, low-income workers were the ones being displaced. Now you're talking about people who are really at the power core of this country: knowledge workers. What do you think will happen, given the high degree of political power that these people have? Will there be a strong political reaction?

I don't think so. Not in terms of shutting down globalization. Very few IT executives could reasonably argue that their companies are not better off today than they were 20 years ago because of globalization. Not just in terms of their companies' profitability but in terms of their incomes. The more important benchmark is not where you were in terms of income in 2000, but where you were in 1993 and 1983—where you might see more activity in terms of the labor market. There will be pressure to make it easier for people to have portability of pensions and be able to gain education later in life, the kinds of things that will enable workers to better transition from these kinds of shocks. The U.S. labor market lacks a lot of those buffers that I think would ameliorate a lot of the sentiment that's out there about this insecurity.

This Date in IT History

Father of the Photocopy

1945 10-22-38 Astoria. So read the world's first photocopy on **Oct. 22, 1938**, in Astoria, N.Y. **Physicist Chester Floyd Carlson** and his assistant Otto Kornei, while dabbling in photoconductivity, poured sulfur across a zinc plate and zapped it with a white-hot light. Carlson then blew the remaining sulfur from the sheet, and voilà! The paper read "10-22-38 Astoria," an exact duplicate of the scribbling on a microscope slide that lay across the plate.

Carlson pitched his invention to companies such as GE, IBM, Kodak and RCA but was rejected by all of them. (Rejection and loss became a familiar theme for Carlson during the next six years: his wife left him, his assistant Kornei left him, and a heap of debt accumulated all thanks to his copying pursuits.) But then, in 1944, the nonprofit Battelle Institute offered Carlson \$3,000 for further research in exchange for three-quarters of future royalties. After the rights to his invention were purchased by the Haloid Co. (later Xerox) and the Greek term *xerography* (translation: "dry writing") was coined, Carlson went on to bank \$150 million and became the father of possibly the most ubiquitous piece of contemporary office equipment.

—Daniel J. Horgan



Chester Floyd Carlson

Other Notable Events

4

The Soviets jump to an early lead in the space race with the launch of **Sputnik** on this day in **1957**.

5

The **first radio conversation with a submerged submarine** happens in **1919**. The U.S.S. *H-2* radioed the destroyer *Blakey* from the depths of the Hudson River.

14

From the confines of the *Apollo 7* spacecraft, the **first live telecast from space** takes place in **1968**.

18

Thomas Edison, inventor of the electric lightbulb, the universal stock ticker and the motion picture camera dies in **1931**.

19

The Justice Department's **antitrust trial against Microsoft** gets underway in **1998**. Microsoft is accused of bullying PC makers into providing Explorer as the default browser instead of rival Netscape Navigator.

SOURCES: About.com, Fairbanks North Star Borough School District, History Channel, HowStuffWorks, Tripod



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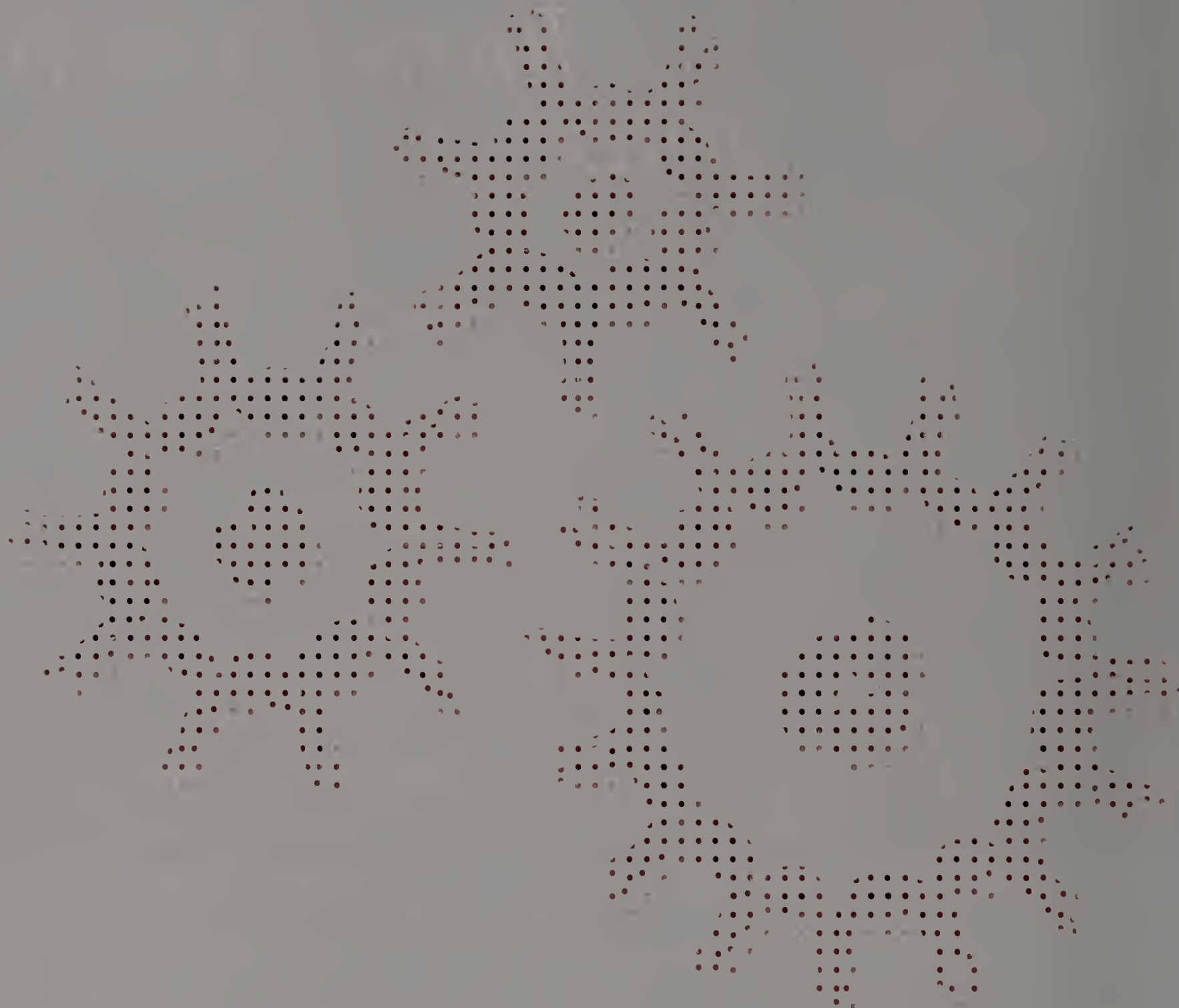
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Culture Clash

You don't need a degree in anthropology to negotiate multicultural IT projects. But as this IT exec discovered, having one sure doesn't hurt.

BY PATRICIA ENSWORTH

WHEN COLLEAGUES LEARN that my graduate degree is in anthropology rather than business or computer science, they're usually puzzled. They assume that I've changed careers, or that studying human cultures is an interesting but frivolous hobby—like, say, building model ships.

In fact, over the years my expertise in anthropology has turned out to be one of the most valuable tools in my management kit. It's particularly helpful now, when more and more IT projects are becoming collaborative endeavors at locations around the world, involving people of vastly different backgrounds.

Consider my experience at Moody's Investors Service. I joined the credit rating agency in 1993 when it was embarking upon a major expansion outside the United States, as well as undertaking an ambitious strategy to replace legacy mainframe processes and standalone desktop applications with a more efficient global data architecture. Today, Moody's publishes ratings and research electronically in real-time on its website. Its analysts gather information about market conditions affecting companies, governments and debt instruments wherever people issue bonds to raise capital. Its internal systems integrate



financial, HR, marketing and workflow operations in offices on every continent except Antarctica.

As an IT manager, one of my responsibilities was serving as the liaison between the central systems development group at the U.S. headquarters and the developers and end users in other countries. That meant leading project teams of staff members, consultants and vendors who were multinational, multiracial, multiethnic, multireligious and multilingual.

Changes in Latitudes, Changes in Attitudes

You might think that a multicultural IT project is much the same as any other. After all, developers who employ the same programming language can usually decipher each other's code even if they don't speak the same human language. English now unites the IT world as Latin once united the Roman Empire. Yet in my experience, multicultural projects almost always generate con-

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flicts. And that's because people from different cultural backgrounds have different notions of leadership. In sum, global workers have varying attitudes about the importance of deadlines, the flexibility of rules and even the need to write things down.

At Moody's, these cultural differences hampered our ability to conduct software testing and engineering process audits. Effective quality assurance requires an independent perspective and an open acknowledgment of defects. Until the mid-

Models or Six Sigma for reconfiguring their processes. Instead, we opted for a simpler solution. We found that culture shock problems could be resolved—or avoided—by making a minor but significant organizational change. A QA manager was appointed at the project manager level. Testers reported to both a project manager and the QA manager in a matrix relationship, raising their status in their own eyes and in the eyes of the developers. The QA manager became responsible for coordinating standards and procedures across the project teams.

The QA manager also served as an ombudsman, combining the functions of a diplomat and a parliamentarian. Not only testers, but also developers, business analysts and product managers were encouraged to regard the QA manager's

Workers around the globe have varying attitudes about the importance of debate, deadlines and rules.

1990s, in a largely homogenous American development environment, the dynamics of QA methodology depended on three very American values. The first was the egalitarian ideal of social intercourse—the way distinctions of rank are supposed to be minimized in our daily interactions. The second, emerging from the first, was the informal give-and-take Americans learn in school as they're encouraged to express opinions, challenge other students (and sometimes even the teacher) and brainstorm solutions. The third was the “tell it like it is” approach to conflict resolution, in which criticism may be expressed, ideally without shame or fear of reprisal.

But many of the IT workers who have emigrated to the United States within the past 10 years do not share those values, and they follow radically different codes of conduct. For some, a caste system or other rigid hierarchy establishes the ground rules of social relations. For others, education means rote learning and strict obedience to authority. In many cultures, open disagreement and direct criticism entail a painful loss of face and thereby close off the possibility of ever resolving anything.

As these values and behaviors collided, gaps in communication began to appear. The relationship between developers and testers changed. Developers have always enjoyed a higher status than testers, yet the formal organizational and informal social disparity widened dramatically. Testers became less willing to criticize and possibly shame their betters, and developers became less willing to collaborate with their inferiors.

Discouraged from pursuing a challenging, intellectual give-and-take with developers, testers sought to demonstrate their productivity by running lots of easy, superficial tests and generating reams of documentation. And although on paper it looked as if we were allocating more and more resources to quality assurance activities, in reality our test coverage and our process audit function were in decline.

Many other companies experience the same dilemma. In response, some organizations seek to employ Capability Maturity

office as a place where they could express sensitive concerns. In an environment where individuals were sometimes embarrassed to call attention to the cultural differences, the QA manager was usually able to approach the issue as a matter of workflow or communication protocol, allowing everyone to save face. After six months of this arrangement, test methodology and coverage substantially improved. Issues of engineering process and risk analysis were being discussed openly again. Both developers and testers felt that communication had become easier.

Skirting the Iceberg

It's an understandable mistake to misdiagnose cross-cultural conflicts as issues of personality or job performance. Like an iceberg, most of a person's cultural identity is below the surface. Differences in accent, clothing, table manners—those are obvious and therefore relatively easy to maneuver around. What don't show are core beliefs and the questions they engender such as: What is fair? What is proper? To whom or what does one owe allegiance? What are the boundaries of ambition and responsibility? Those submerged incompatibilities pose the greatest danger to successfully navigating IT projects.

At Moody's, I was the QA manager who confronted these issues. But nowadays, you may not need a professional anthropologist. An increasing number of organizations provide training in multicultural management. This practice makes good business sense. Not only can it help avert problems, it can also show IT executives how to transform their workforce from mistrustful tribes eyeing each other across the cultural divide into a corps that profits from each other's perspectives. **CIO**

Patricia Ensworth, a former vice president at Moody's Investors Service, is the author of *The Accidental Project Manager*. She is president of consultancy Harborlight Management Services and can be reached at info@harborlightmanagement.com.



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Tom Davenport | The New Work Order

Retooling the Knowledge Worker

Putting It All Together Again

Knowledge worker productivity:
your questions answered

THIS BEING THE LAST in a series of columns here about knowledge worker productivity, I thought you might be expecting some answers. One thing I know for sure: Depriving knowledge workers of sleep is definitely not a route to enhanced productivity. I started this column on my way to Thailand (and highly sleep-deprived), and it turns out I was not very productive at all!

But before I answer your questions about what does work well, a brief review of the problems might be useful.

- Knowledge work is hard to measure, so most of us don't bother.
- Although not all knowledge workers are alike, there is no standard classification or segmentation scheme for them.
- There are lots of "productivity tools" for knowledge workers—too many—but they don't connect well with each other.
- The organizational support for knowledge work is similarly fragmented and comes from a variety of IT organizations, human resources, facilities organizations and so forth.

So how do we put this Humpty Dumpty back together again? One approach is to integrate the various technologies that knowledge workers use. In the past week, for example, I've met several people who have shifted to PDA/cell phone



combo devices—not because they are cool gadgets, but because they hold the potential for simplifying life. At the very least, they can reduce the number of devices to carry and limit the number of name-and-address files to manage.

By the same logic, the fewer computers one uses, the better. Many people have begun to use their work laptops for all their computing needs. That is, of course, if your organization doesn't mind you using its machine for personal applications and messaging, and that you don't mind using a laptop for everything. A lot of people (including me) already carry a laptop everywhere, so we might as well get the benefits of "architectural consolidation" and bag the home desktop altogether.

Another IT-related approach is to integrate the various support groups for knowledge worker technologies. At most large organizations today, there's one group to support messaging technologies, one for knowledge management, one for per-

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sonal productivity applications and perhaps another for help on wireless communications devices. The different groups mean that IT is unlikely to develop an integrated approach to helping knowledge workers use these tools effectively. The individual employee is left to his own devices, so to speak.

I came across one organization that is addressing this problem, however. Intel's IT organization has recently reorganized itself to combine the knowledge management, collaboration and personal productivity groups. Called eWorkforce, the group supports knowledge worker use of PCs, laptops, cell phones and PDAs. The primary goal is to develop integrated solutions for "generic" knowledge worker processes—arranging and con-

Since all knowledge workers aren't alike, we need to segment them into meaningful categories and apply IT and process improvement approaches differently for each category.

ducting an asynchronous meeting or managing a project. While I believe it's a great step forward to integrate devices and support organizations, I'd argue that to make real progress in knowledge worker productivity, we need to disintegrate the target audience. That is, since all knowledge workers aren't alike, we need to begin to segment them into meaningful categories and apply IT, process improvement approaches and other productivity aids differently for each category.

The question is what sort of segmentation scheme to use. Intel has created one based primarily on behaviors and attitudes toward technology. Its categories are as follows:

- **Functionalists**—Primarily manufacturing workers (but including some office workers) who use IT occasionally but don't rely heavily on "office IT" to perform their job functions.
- **Cube captains**—Spend the majority of their time in the office, are very mainstream in their office IT needs and are overall very happy with the tool sets they have.
- **Nomads**—Heavy users of remote access and mobile IT, whether while traveling or working in remote offices.
- **Global collaborators**—Interface often with people around the world; they resemble nomads but work across time zones and need access to collaboration tools, anywhere, anytime.
- **Tech individualists**—They want and adopt early the latest IT tools and are willing to take risks with them.

These probably wouldn't be the right categories for all organizations, but I view it as a great step forward for Intel to create and address them. Intel's next step is to put them in the context of business process and business unit needs.

My own hypothesis is that the best way to segment knowledge workers would be by the roles they perform within the organization. I would guess that determining whether you're a "field sales analyst" or a "midlevel marketing manager" would drive the type of work you do and how it could be done more productively and effectively. Of course, that will be difficult and perhaps expensive. Most organizations don't even know how many roles they have. I suspect the only role-based segments that might make sense are those in which there are many workers in a single segment, or in which better productivity or performance is mission-critical.

A great example of such a role-based approach is at the global telecom company BT, which has focused considerable effort on its 15,000 customer contact workers. The focus for these workers was less on increased productivity (typically measured in call-handling times) and more on improved customer service through better availability of relevant information and knowledge. BT implemented a new role-specific portal, BT AdvisorSpace, within

its customer contact centers. BT's goal is to make available all needed information and knowledge in real-time while the customer is on the phone—and eventually to bring the relevant information to the screen automatically based on the current customer transaction. Already the new system has led to a several percentage-point increase in customers feeling that their adviser was helpful and knowledgeable (it's at 97 percent now). The advisers' confidence in the information they use is up by 23 percent. To me, that's a great example of what an organization can accomplish when it focuses its efforts and information resources on a particular role.

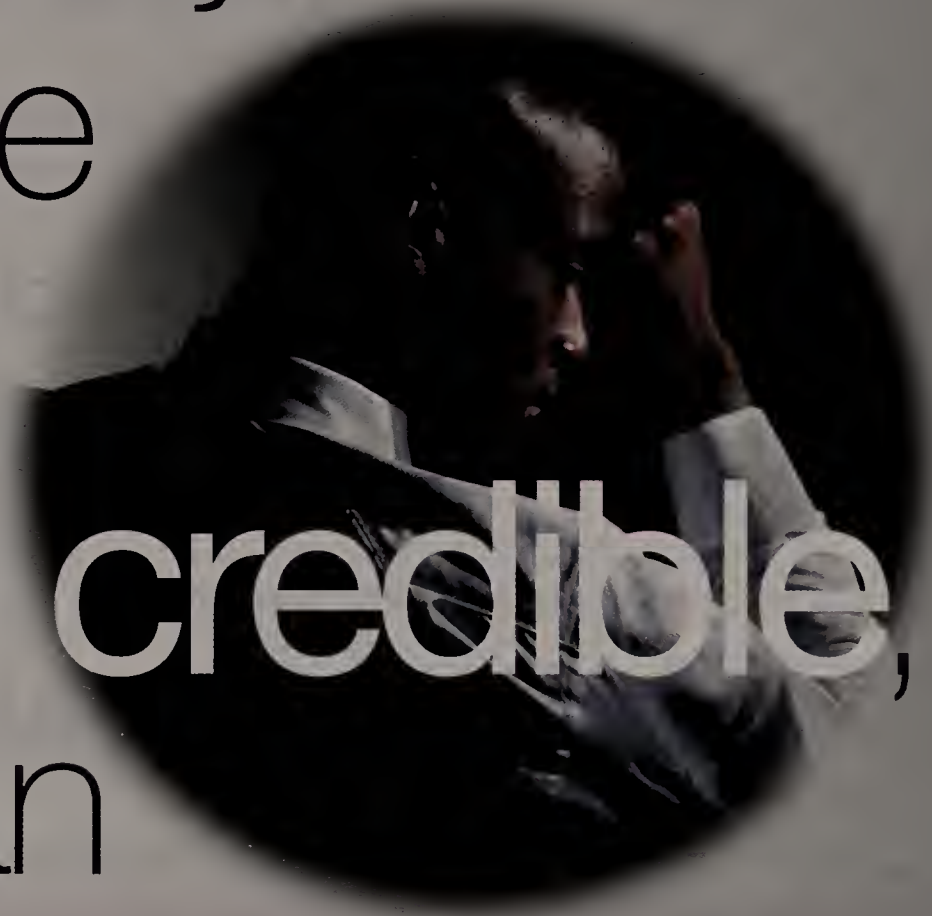
Of course, there are important ways to improve productivity that don't involve IT. One is to ensure that there are measures of productivity and effectiveness in place (easy in call centers, harder with more autonomous knowledge workers). Another is to develop business process standards such as the Capability Maturity Model I mentioned in my last column. A third is to treat every intervention into knowledge work as an experiment—with measures, a control group, clear hypotheses about the result and so forth.

I'm more confident than ever about the importance—and the difficulty—of addressing the topic of knowledge worker productivity. Just remember: It's the Next Big Thing, and you heard it here first. **CIO**

Tom Davenport (tdavenport@babson.edu) is director of the Accenture Institute for Strategic Change and professor of IT and management at Babson College.



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of IT and business workers?

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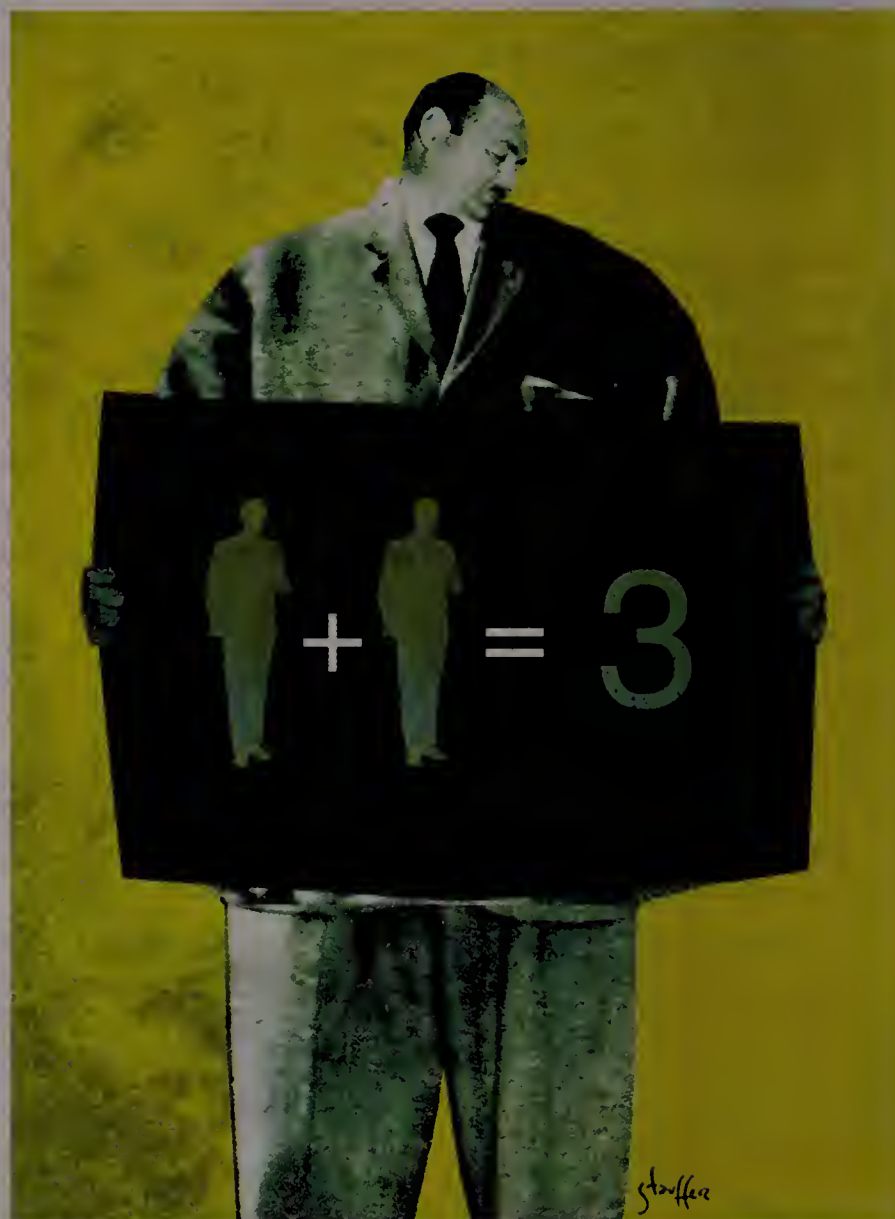
Wanted: Metric Skeptics

Accepting vague or irrelevant numbers for project value measurements can lead to bad IT spending decisions

I CONFESS. I'M A NUMBERS KIND OF GUY. But I'm concerned. I see too many numbers, with too little meaning, cavalierly factored into too many IT value discussions. Metrics are often management's single most important determinant of value. So allowing anything less than top quality numbers—and the correct context for these measurements—leads to wrong decisions about which IT investments to select, which implementation paths to choose or what portfolios to manage.

There are three common ways that people misuse metrics: tolerating ambiguity, discouraging guesstimates and overlooking available sources. Let's take a look at some solutions for avoiding these missteps.

Tolerating Ambiguity Numbers falsely convey a mystique of truth, by their very existence. But rarely do numbers actually mean what they seem to imply. That is because a metric is not “the result.” It is shorthand for a story about the result. If the metric user leaves out the story portion of the metric, we are left to make potentially erroneous assumptions to fill in the gaps. For example, if someone states “we have a 25 percent customer retention rate,” he is providing us with an ambiguous



metric. Because the story behind the metric is missing, his message has no infallible meaning. In this example, a good metric story might say: “Our internal audit committee confirmed last April that our Southern division has experienced a 25 percent customer retention rate, for those customers who have bought at least \$10,000 annually from us, for the past three years in a row. Sue Smith, vice president of finance, has stated that this retention rate is too low to allow us to realize the gross margin goals for this year.” Armed with that explanation, we are less likely to misuse the metric's meaning and implications, and can make an informed decision.

Discouraging Guesstimates Another misuse of numbers occurs when management refuses to accept guesstimates (informed estimates) as legitimate metrics. This problem occurs whenever someone says, “If you can't prove it, we won't use it.” In this mistaken worldview, only hard metrics from fac-

ILLUSTRATION BY BRIAN STAUFFER

You did everything right, *but...*



If your IT spending isn't aligned with the business strategy, you've failed the company.

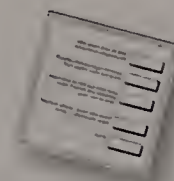
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tual situations are valid. The clear message is that guesses don't count. The reality is that informed guesses are what makes the world work. If business investment strategies were 100 percent fact-based, we wouldn't need high-price executives to guide the company. Computers could probably do the job via fancy calculations. The whole discipline of risk management is ultimately grounded in probabilities, which themselves are estimates. The medical profession begins and ends with the reliability of doctor diagnoses, none of which are 100 percent

Metrics are often management's single most important determinant of value. So allowing anything less than top quality numbers leads to wrong decisions about which IT investments to select.

correct. But they get enough right that we don't ban their profession. A similar situation exists with our economy's reliance on meteorologists. They don't hit the mark 100 percent of the time. But their track record is good enough for airplanes to fly safely through troubling storms, not to mention properly attiring our families for school and work. The key to accepting informed guesses as valid metrics is to make sure they: A. Come from knowledgeable, experienced and dependable people; and B. Are accompanied by clear explanations of the guesstimate's premises, assumptions and logic.

Overlooking Available Sources For many CIOs, the most distressing situation occurs with metric misuse when the really good, hard, relevant ones exist, but they go undiscovered. More often than not, this occurs from lack of elementary research

Get Relevant Metrics

Want metrics that are reliable, easy to use and clear? Check out our online Metrics column. We run:

- **BRIEFS** (Were your e-commerce sales among the nearly \$12.5 billion in the second quarter of 2003?)
- **FLASH CHARTS** (Are you one of the 4 percent of CIOs who expect to decrease their IT staff in 2003?)
- **REPORTS** that go behind the numbers to the people who found the data in the first place.

Go to www2.cio.com/metrics.

cio.com

skills by those charged with finding such metrics. In this age of information overload, useful metrics, of direct validity for the company's situation, may well exist, yet are hidden within readily accessible sources—such as the publications from trade associations, research by business schools and surveys from industry analysis firms, to name a few. Ironically, sometimes an organization's customers either have the missing metrics or

would be willing to set up a program to find them, but no one has asked them to do it.

These are all metrics missteps that routinely derail projects or lead to costly and incorrect decisions. But using numbers correctly is a skill that can be learned. Read on for some specific advice on how to help your enterprise use numbers in more powerful ways.

Five Steps to Ensure Reliable Metrics

You can use several methods to make your staff and management aware of the pitfalls of misusing numbers. Here are some ways to strengthen your organization's metric savvy-ness:

Conduct Sensitivity Education

Alert both management and staff to the promises and pitfalls of metric usage. Help them to become more sensitive to metric fumbles, as well as home runs. Assist hard-core

numbers people in getting more comfortable with solid guesstimates built on informed analysis.

Apply the Metric Trustworthiness Test Apply this three-way test to all metrics: 1. Is the metric clearly defined and explained? 2. Is the source of the metric visible and credible? 3. Is the metric's story readily available and relevant to our situation? Trustworthy metrics score three out of three on this test.

Actively Seek Industry and Vendor Help Identify industry trade associations, industry analysts and vendors that consistently pass the Metrics Trustworthiness test. Tell them what types of metrics you are looking for, then ask for their help in finding them.

Do Internet Research Aggressively Find relevant metrics from studies by others. Try searching the Internet, using keywords such as *metrics* and a topic. For example, a Google search using the keywords *metrics* and *help desk* brings a wealth of information for a help desk business case.

Publish Internal Guidelines Publicize the organization's view concerning what types of metrics are valid, why and where to find them.

Projecting a healthy skepticism toward numbers dealing with IT value can help turn metric disrespect into metric success. Like many good things in life, however, success at "metricification" requires a modicum of education, discipline and persistent follow-up. Fortunately, it's worth it. **CIO**

Jack Keen is founder and president of the IT consultancy The Deciding Factor (www.decidingfactor.com) and coauthor of *Making Technology Investments Profitable: ROI Road Map to Better Business Cases*. He can be reached at jack_keen@compuserve.com.



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SPECIAL REPORT

WEB SERVICES

THE STANDARDS

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- ▶ Why conflicting Web services standards are emerging
- ▶ The threat of fees and licensing restrictions
- ▶ What CIOs can do to ensure future interoperability

THE EARLY ADOPTERS

Page 64

- ▶ Benefits for using Web services now
- ▶ Five major risks confronted by early adopters
- ▶ How early-mover companies are mitigating those risks

The Battle for Web Services

Everyone wants Web services standards.
CEOs think the technology will create new opportunities.
CFOs believe it will save millions.
Vendors see a pot of gold at the end of the Web services rainbow.
And CIOs know that linking to customers and partners over the Internet will revolutionize both business and IT.
So what's the holdup?
The usual suspects: Politics. Ego. Suspicion. Fear. Greed.

BY CHRISTOPHER KOCH

It's already a given: Your company is going to waste money on Web services.

Research company Gartner predicts American business is going to squander \$1 billion on misguided Web services projects by 2007. Exactly how much of that will come out of your pocket depends in part on how many confusing, overlapping Web services standards emerge in the next few years.

Right now, it looks like there's going to be a lot of them.

The Web services standards process began to fall apart this year. No fewer than four organizations—Liberty Alliance, Oasis, W3C and WS-I—are vying to preside over the process, each with different goals, each with differing degrees of power and influence.

And two opposing camps of vendors have emerged: an uneasy alliance of IBM and Microsoft versus nearly everyone else. Both groups are busy duplicating each other's work.

Both are proposing Web services specifications—some proprietary, some not—with unclear patent and licensing implications for CIOs. In an arena as complex as Web services, confusion is not a good thing. But right now, that's the situation.

The Web services vision is grand: a universal set of communications protocols to enable computer systems and business processes to seek each other out over the Internet, lonely hearts style, and have deep, meaningful interactions with no human intervention. Even in today's rudimentary state, Web services standards such as simple object access protocol, or SOAP (see "Core Web Services Standards," Page 58, for the list of current standards), are proving to be valuable integration technologies. A Gartner survey of 110 companies found that 54 percent are already working on Web services projects or have plans to begin soon, and IDC (a sister company to CIO's publisher) estimates that companies will do \$2.2 billion worth of Web services projects in 2003 and \$25 billion in 2008.

"The potential revenue impact of these

standards is enormous," says Whit Andrews, research director for Gartner. But the very size of that financial prize waiting for the winners of the Web services standards competition makes it "difficult to remain involved in a standards effort that involves your competitor," he adds. Gartner goes so far as to predict that the alliance between IBM and Microsoft will break down by the end of this year, given that the companies are direct competitors in the application server and database markets that make the biggest use of Web services.

"That's silly," responds IBM spokesman Steven Eisenstadt. Steven VanRoekel, Micro-

soft's director of platform strategy, says, "I couldn't speculate on how long things will go [between Microsoft and IBM]."

And what about the users? Where are the CIOs?

Some companies have gotten involved with the standards-setting organizations, including financial services heavyweights such as Fidelity Investments and J.P. Morgan Chase, as well as some forward-thinking manufacturers such as GM and health-care giant Kaiser Permanente. But they remain the minority in organizations that, by default, are overwhelmingly dominated by vendors.

"CIOs haven't gotten involved because

it's a big time commitment, so they say, You vendors figure it out," says Eric Austvold, research director for AMR Research. "That's like putting the fox in charge of the henhouse."

If CIOs continue to stand on the sidelines, they may very well end up with no chickens, forced to choose from among multiple Web services standards that may not interoperate, may have limited life spans, and may come with fees or other onerous patent and licensing requirements.

And if so, CIOs can start ticking off their shares of that wasted \$1 billion right now.

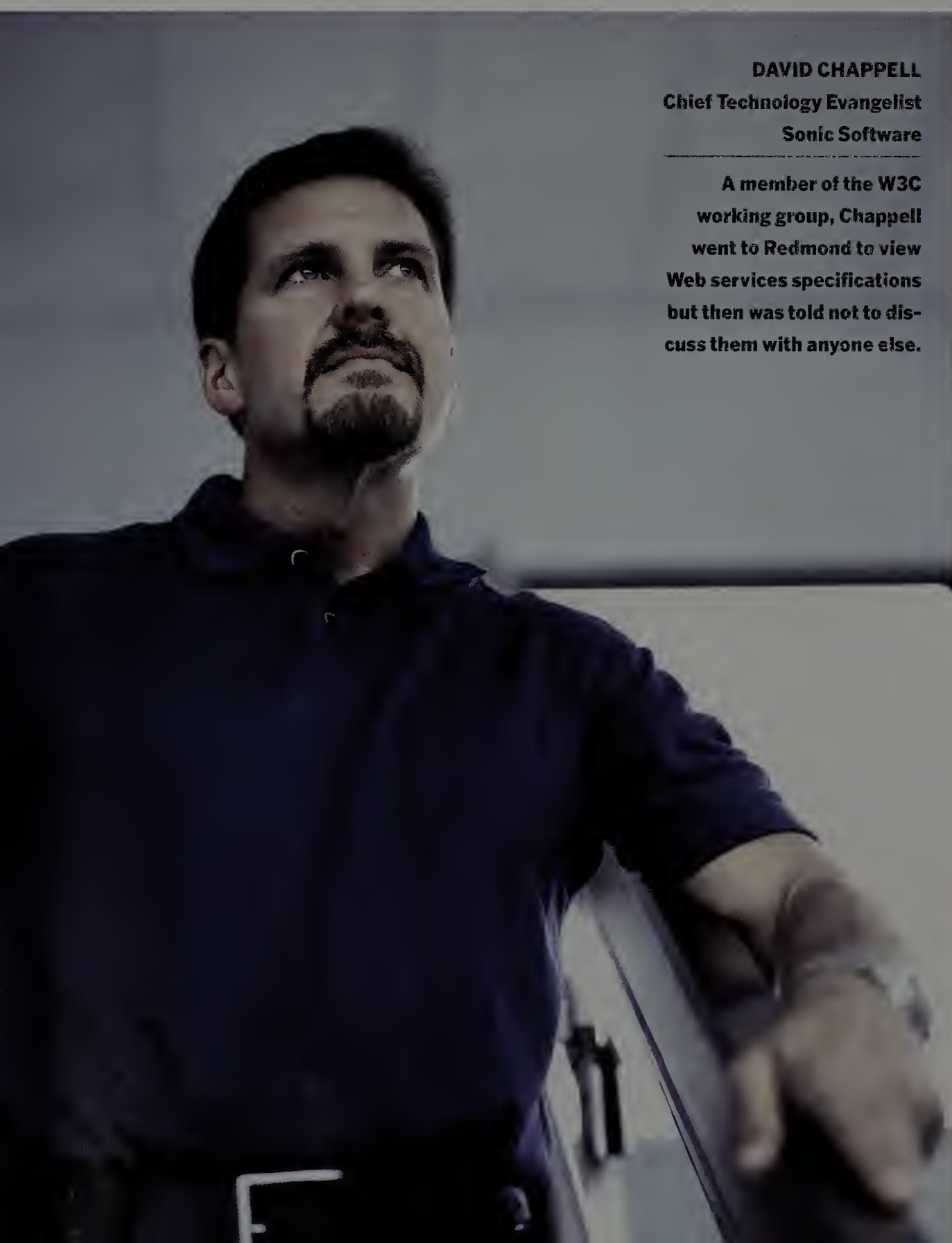
FEAR OF FEES

Contrary to the hype that surrounds Web services, there is no guarantee that the technology will continue to follow the path it has followed so far, which is that it is free and comes with limited restrictions.

In fact, the free model for Web services already has been tested and has just barely survived. In the spring of 2002, just as standards organization Oasis was about to ratify the specification for ebXML (electronic business using extensible markup language, designed to help companies transact business across borders and languages), IBM announced that it held patents for a piece of the specification and that it would offer it under a licensing model called Reasonable and Non-Discriminatory (RAND). If that had stood, vendors would have had the right to charge fees and apply usage restrictions to individual users of the software on a case-by-case basis. But after other contributors to the specification, including the United Nations, claimed that IBM previously had pledged that its work would be royalty-free, IBM issued a statement saying it would relinquish any rights to fees. "We were happy to clarify that we did not intend to charge a fee when we realized that some of the industry was confused," says IBM spokesman Eisenstadt. "We had never proposed that we would charge a royalty; we were simply following the process as defined by the standards body."

DAVID CHAPPELL
Chief Technology Evangelist
Sonic Software

A member of the W3C working group, Chappell went to Redmond to view Web services specifications but then was told not to discuss them with anyone else.



The Standards Scorecard

You can't tell the organizations apart without one. Who's who, and what's what.

OASIS

What It Is: Founded in 1993 under the name SGML Open, the Organization for the Advancement of Structured Information Standards worked on the standard generalized markup language until XML came along in 1998. Then it shifted its focus to XML and later Web services.

Its Agenda: Oasis focuses on the high-level Web services used in applications. It lets individual technical committees decide whether they want to consider specifications that have royalties attached to them.

W3C

What It Is: Founded in 1994 by the inventor of the Web, Tim Berners-Lee, the World Wide Web Consortium is famous for Internet standards such as HTTP and HTML.

Its Agenda: Though it has traditionally focused on the Web infrastructure level, W3C has moved into Web services as an extension of its core standards like XML. All submissions it ratifies into standards must be free of royalty fees.

WS-I

What It Is: Founded in February 2002 by Microsoft, IBM and seven other vendors, the Web Services Interoperability Organization focuses on developing tested implementations of Web services standards in packages called profiles. Sun has called it "a shadow government for standards."

Its Agenda: To deliver installation-ready Web services packages, complete with tools and guidelines.

LIBERTY ALLIANCE

What It Is: Cofounded by Sun in 2001, Liberty Alliance's mission is to develop Web services specifications for identity management using security assertion markup language, an Oasis security standard.

Its Agenda: Liberty focuses exclusively on identity management and security issues.

Both Eisenstadt and Microsoft's VanRoekel say their companies will not charge royalties for the specifications that they offer to standards bodies. But both companies will continue to use RAND licensing for their specifications, which means that other restrictions could be placed on the use of the technology.

Web services needs to be free of cost and other license restrictions if the industry and its customers are to adopt them on a broad enough scale to make interoperability a reality, say standards believers. If the vision for Web services comes true, and companies use these standards as they use HTTP and HTML—that is, constantly—then royalties on Web services could become like a tollbooth for business on the Internet, chipping money out of every transaction that crosses the wires.

Worries about intellectual property led one standards organization, W3C (the World Wide Web Consortium), to adopt a policy that all specifications it ratifies into

standards must be free of fees and other restrictions. In addition, companies submitting specifications for consideration as standards must declare their licensing and patent intentions up front before the standard comes to a vote.

Critics say that has driven Microsoft and IBM into the arms of another standards organization, Oasis (Organization for the Advancement of Structured Information Standards), which has less rigorous requirements regarding patent and royalty issues. "At Oasis, we do have a policy that allows for specifications to have patent claims," says Patrick Gannon, the organization's president and CEO. "The result is that over 90 percent of the specifications from Oasis have no royalty related to them."

But it's that last 10 percent that has people worried. Web services standards are like pieces in a puzzle: Most are dependent on other pieces to make a whole. If just one of the necessary pieces has royalties or restrictions attached to it, the system is not free.

WHY STANDARDS OVERLAP

In June 2002, a vendor coalition led by Sun Microsystems wrote a specification called WSCI (Web Services Choreography Interface, or Whiskey, in geek-speak). A few months later, IBM, Microsoft and a few other vendors offered up BPEL4WS (Business Process Execution Language for Web Services), a specification that overlapped with WSCI. W3C formed the Web Services Choreography Working Group to consider the specifications. At the first meeting, a researcher from Microsoft showed up "to determine if he wanted to join the working group," says Microsoft's VanRoekel.

David Chappell, Sonic Software's chief technology evangelist and a member of the W3C working group, remembers the meeting well. He says the representative from Microsoft and one from BEA Systems "were clear that there was this other BPEL initiative, and they said, 'The wishes of both Microsoft and BEA are that the group focus on things that are complementary to BPEL

and not competing,” recalls Chappell. “The response from the group was, ‘We’ll take that under advisement.’ So Microsoft said, ‘We’re not going to participate.’” The Microsoft representative never returned, although BEA continued to be a part of the group. IBM does not have a representative in the group.

Microsoft’s VanRoekel says the researcher made the decision whether to join the group meeting as an individual, “independent of him being a member of the Web services group at Microsoft.” But the damage had been done. Some vendors, most notably Oracle and Sun, took it as a snub and a signal that IBM and Microsoft were going to go their own way on Web services.

Indeed, Microsoft and IBM took their BPEL specification (which each had been working on for years and had embedded into their products) to Oasis and formed a committee to begin working on a standard. Responding to complaints about potential confusion and duplication, Oasis and W3C established liaisons to coordinate work between the two groups to try to avoid overlap.

As of this writing, they’re still working at it.

OASIS VERSUS W3C: TITANS CLASH BY PROXY

If there’s a driving force behind the growing competition between Oasis and W3C, it’s less the organizations themselves than it is their predominantly vendor membership. They’re split into two major camps: IBM and Microsoft on one side and Sun and (usually) Oracle on the other, with smaller vendors trailing in the wake of both. IBM and Microsoft worked together to build the first major Web services specification, SOAP, that they offered to W3C for consideration in 2000 (W3C later modified and ratified it as a standard in June 2003). In April 2001, IBM and Microsoft submitted a road map to W3C of the specifications that they believed needed to be added in and around SOAP to fill out the Web services stack, as it is known.

IBM and Microsoft have followed that road map ever since, publishing 20 different specifications for Web services. Critics say the plan is both an impressive technological vision...and a rationale for excluding other vendors—and even the standards organizations—from the process. Of the 20 specifications, only two have been submitted to any standards organization for consideration. Critics charge that the others are being held back while the two companies work to perfect them and build them into their products, thereby giving them an advantage in the market.

“If you look at the pattern of behavior that’s been established by Microsoft and IBM, it’s clear that they want to create specifications in a vacuum without input and hold them close to the vest while they develop them in their products and then release them to the standards organizations,” says Ed Julson, group manager of Web services standards and technology for Sun.

Core Web Services Standards

XML (extensible markup language) The lingua franca of Web services. All Web services can communicate in XML.

SOAP (simple object access protocol) A communications protocol for Web services.

WSDL (Web services description language) An XML-based language for describing, finding and using Web services.

UDDI (universal description, discovery and integration) A phone directory for Web services that lists available Web services from different companies, their descriptions and instructions for using them.

“We’ve worked together with industry partners to be sure that the standards process starts with a well-defined proposal,” responds IBM’s Eisenstadt.

When Microsoft and IBM do offer up their specifications for input, critics say, it’s usually behind closed doors rather than in the open forum of a standards meeting. Sonic’s Chappell recalls being invited to Microsoft’s headquarters in Redmond to view two Web services specifications. “IBM and Microsoft were being hammered for going off and doing their own thing,” he says, “so this was viewed as a way of opening things up.” But Chappell says he had to sign an agreement saying he would not discuss the specifications with anyone else and that anything he contributed to the development would become the intellectual property of the companies writing the specifications.

Microsoft’s VanRoekel says his company does not require visiting vendors to sign nondisclosure agreements. “You’re welcome to talk about what’s going on,” he says. But he says Microsoft does make them sign a feedback *agreement* that stipulates that “if you come and offer input on this technology, then that input must be made available royalty-free.” He adds that Microsoft plans to publish results of vendor feedback sessions on a public website this fall.

Critics say Microsoft and IBM’s strategy of writing specifications outside of the standards groups limits give-and-take. “It’s turning into a proxy war where Microsoft and IBM are coming up with what they feel will be the standards and shopping them around to see who will rubber-stamp them,” says an official from a standards group who requested anonymity. “If one won’t take it, they take it to the other. They’re playing W3C and Oasis off against each other.”

Last January, another conflict broke out between the two vendor camps, this time within Oasis. After a coalition of vendors led by Sun, Oracle and Sonic submitted a specification to ensure reliable delivery of messages (called Web Services Reliability) and formed a committee, Microsoft and

IBM published their own specification called WSReliability, which has not yet been submitted to any standards organization.

Microsoft's VanRoekel says his company is simply following the road map it submitted to W3C. "The reason we take this approach is to make sure the specifications are well-engineered, have a fast time to market and have something we call composability, which means they work well with the other pieces out there," he says. "What has typically happened in the standards bodies where you design by committee is that the end product is so open for loosely interpreted implementation that you end up not having technology that will work with other pieces that have been developed out in the industry."

END RUN AROUND THE STANDARDS BODIES

In February 2002, Microsoft and IBM, along with seven other vendors, founded the Web Services Interoperability Organization, or WS-I (famously excluding Sun from the group's board at first, but later allowing it to join). WS-I is not a standards organization per se, but it combines different Web services pieces in an installation-ready package. It calls these packages of Web services "profiles," and offers tools and guidelines for installing them. The first profile, called the Basic Profile, was released last August.

"[WS-I is] a supra-standards body that ratifies which of these standards will be the baseline for Web services," says Dan Sholler, vice president and director of technology research services at Meta Group.

The problem, critics say, is that WS-I can pick and choose the pieces it wants to include in the profiles. "With WS-I, Microsoft and IBM have set up a shadow government for standards," charges Susy Struble, program manager of Web standards and technologies for Sun.

The first profile, for example, contains versions of SOAP and WSDL (Web services description language) that were never ratified as standards by W3C but are included

PATRICK GANNON CEO, Oasis

According to Gannon, about 30 percent of Oasis's membership comes from user companies, but the number active on the technical committees is much smaller.



in Microsoft and IBM products. But W3C has approved versions of SOAP and WSDL that have been modified from the versions contained in the WS-I profile. That means CIOs are being presented with two different versions of the core standards for Web services.

"These standards are always evolving," says Microsoft's VanRoekel, who is a member of the marketing committee for WS-I. "W3C ratified SOAP late in the process of putting together the first profile. [The W3C standard version] will be incorporated into the next profile." IBM's Eisenstadt agrees, adding, "These versions of SOAP and WSDL have the broad industry adoption

that is needed."

But what if competing standards come out of W3C and Oasis?

"Multiple proposals indicate lots of interest—it's not evil," says IBM's Eisenstadt. "The market should decide which proposals are best. Interoperability is the whole point of Web services, so single standards will emerge."

Adds VanRoekel, "WS-I will take a look at what customers are implementing and decide [which standard to include in a profile] based on that." He encourages those with concerns about the process to join WS-I. "IBM and Microsoft aren't the only members of WS-I," he says. "We don't

decide what the WS-I does.”

Indeed, Microsoft and IBM are not alone in contributing to the confusion. Sun has cofounded its own standards group, Liberty Alliance, to develop a Web services standard for identity management that uses SAML (security assertion markup language), an Oasis security standard. (Microsoft and IBM have released a specification called WS-Security that, according to Sai Allavarpu, group manager of Sun One Network Identity, treads near the same turf.)

But with their combined market clout, Microsoft and IBM have the power to push

their own specifications and ignore others to death. At least that’s what AMR’s Austvold predicts will happen to the WSCI business process specification now before W3C. “That’s going to be dead within 24 months,” he says.

“Can you have a standard without Microsoft’s and IBM’s participation?” asks Meta Group’s Sholler. “Yes.” But if that standard does not appear on the Windows platform, which commands upward of 95 percent of the PC market in the United States, and does not appear in IBM’s Unix and mainframe platforms, will anyone use it? he asks.

WHY CAN'T WE ALL JUST GET ALONG?

Microsoft and IBM have invested a good deal of marketing money—and a lot of good technology—into Web services to build the perception in the market that *they* are making it happen. Other vendors want their customers to think the same of them.

“I am not sanguine about there being a successful outcome for Web services because it looks to me like there is an increasing likelihood of fragmentation and confusion in the market rather than a convergence,” says Don Deutsch, vice president of standards strategy and architecture for Oracle. “We go into a standards endeavor with the objective of defining things of common interest that will create a new market, or improve an existing market, so we can all compete on price and performance. If there are some members who don’t believe they can participate on an equal basis, then historically the competition begins and fragmentation begins. That confuses customers, and when customers are confused, they don’t buy because they don’t know what to buy.”

Ironically, if the alliance between IBM and Microsoft breaks down, things could get even worse. If the two leading vendors in Web services were to begin sending competing specifications to the different standards organizations for approval, forget about attaining a single set of interoperable standards soon, if ever. Regardless of what happens between IBM and Microsoft, however, as long as vendors remain split and standards organizations continue to allow conflicting work inside their organizations, the Web services standards movement will continue to be disrupted by confusion, delay and the possibility of duplicate, conflicting standards emerging. For CIOs, that could translate into slow, expensive, dead-end projects at a time when Web services could be saving them time and money in a tough economy.

“One of the things that would be nice is if this alphabet soup of standards groups would get together and say we’re all about delivering a single standard,” says Dave

DAVE WATSON

CTO

Kaiser Permanente

“I’d love to get everyone to say there’s one set of standards and keep overt agendas at the door. But unfortunately the agendas that form these groups don’t allow that. Dig deep enough into the woodpiles of these standards organizations, and you’ll always find a vendor as the mommy or daddy.”





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Watson, vice president and CTO of Kaiser Permanente, which is active in WS-I. "I'd love to get everyone to say there's one set of standards and collapse at least four different discussions into one and keep overt agendas at the door, because you don't serve customers that way. But [unfortunately] the agendas that form these groups [don't allow that]. Dig deep enough into the woodpiles of these standards organizations, and you'll always find a vendor as the mommy or daddy."

THE BUSINESS OF STANDARDS IS BUSINESS

If there is a force that can keep the Web services standards movement from blowing up, it is CIOs. But few CIOs have the

vendors feed them."

Besides the obvious bandwidth issues, many CIOs say that with the shift to packaged software in their organizations, they don't have the technical expertise to contribute much to standards organizations. But in fact, that's not where CIOs are most needed, says Sun's Struble: "CIOs should be involved in the early requirements phase, the part where we define what we want the standard to do."

Indeed, those CIOs who have gotten involved in standards organizations have done so to make sure that what emerges is right for their businesses. "We can put our requirements on the table and have a dialogue," says Andrew Comas, who, as vice president of technology, is J.P. Morgan

Web services model. For GM, the issue is the OnStar communications network it's building into its cars and trucks.

But the link between Web services standards and business goes even deeper for these companies. The sooner they know where the standards are going, the sooner they can begin shaping their architecture to take advantage of Web services faster than their competitors can.

"We take these public standards and add in our own standards and pass that down into the organization," says Adrian Kunzle, who is cohead of the architecture group at J.P. Morgan Chase's investment banking division. "Our participation in standards groups comes from the fact that we're up front about creating an architecture strat-

"If you need what this standards activity is producing and you choose not to play at some level, then you can't complain about the product you receive."

—Kaiser Permanente CTO Dave Watson

interest or resources to participate in the different standards organizations. About 30 percent of Oasis's membership comes from user companies, according to Gannon, though the number of user members who are active members of the different technical committees is much smaller. The number of members in each of W3C's four different Web services working groups who *do not* sell or service technology does not rise above 10 percent, and in most cases can be counted on one hand (most of the groups have about 50 members). At WS-I, the user company membership is less than 10 percent. Liberty Alliance's user membership is just under 30 percent.

"The structure of these groups is backward," says AMR's Austvold. "The users should be the ones creating the standards, and the vendors [should be] adopting them. Right now, users have to take what the

Chase's representative at WS-I. "If I'm not at the table, then I'm having the vendors say what's best for us."

The companies that are involved connect the work they do in the standards organizations to their core businesses. J.P. Morgan Chase and Fidelity Investments are concerned about the speed of online transactions and the quality of products presented to customers over the Internet. Kaiser Permanente cares about the movement of online health-care transactions standards known as HL7 from EDI to a

egy for our organization. We want to understand where they are going early so we can plan."

Of course, the commitment required to participate in the development of technical standards is considerable. These efforts can go on for years. "On a topic you're interested in, it's easily a couple of hours a week," says Bill Stangel, enterprise architect for Fidelity. He says Fidelity has a dozen or so staffers involved part-time with various technical committees in standards organizations. Other companies have similar stories: part-time participation of anywhere from six to 10 staffers. Not a bad investment, they say, considering the insight it gives them.

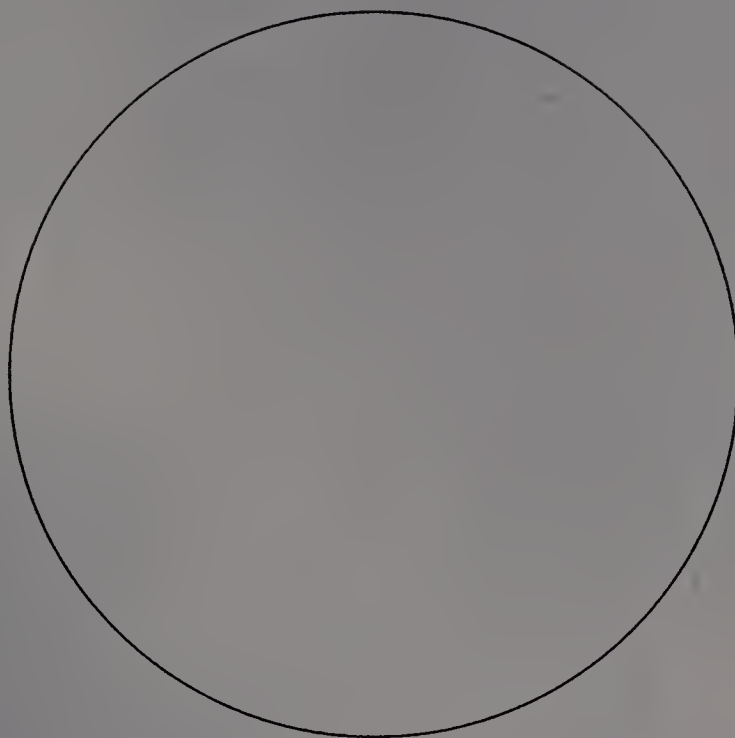
"Without awareness of what's going on with standards, it's game over," says Tony Scott, CTO for GM, which is actively involved in Liberty Alliance. "That aware-

Share Your Opinion

Do you become part of the standards story, or wait it out on the sidelines? **Are Web services the next new thing or the newest headache?** Whatever your take on Web services, post your thoughts at **ADD A COMMENT** on the online version of this article.

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ness allows my organization to provide guidance to the wider IT organization inside GM about where they should be placing investment. What's emerging, what's changing, what's obsolete."

For companies that cannot afford to get involved directly, Scott recommends they try to exert influence with their vendors. "We have a lot of clout, obviously," says Scott. "We actively engage the R&D community in areas that we think are important. If we start asking a lot of questions about a particular technology or standard, they get the message."

Finally, say these technology executives, it's important to vote for standards and interoperability with your checkbook. "The theme of interoperability is not going to go away," says Kaiser Permanente's Watson, saying he wouldn't buy a product if it "complicated the interoperability issue."

Standards are inextricably linked to the future of business through the Internet. That they are floundering today means business will flounder tomorrow.

"Standards are the basis of competition going forward," says GM's Scott. "It's not just your ability to make and sell that matters anymore. We used to have a 48-month product development cycle; now we're down to 18 months, and we're trying to get to a year. When you have that kind of rapid change, you have to have architectures and standards and interoperability. If you can set the standard or drive the standard, that enables you to get to market faster and have a broader market than might have ever been the case prior to today. Think of standards as an accelerator to your business."

But you can't affect those standards if you don't get involved, says Kaiser Permanente's Watson. "If you need what this standards activity is producing and you choose not to play at some level," he says, "then you can't complain about the product you receive." **CIO**

Send feedback via e-mail to Executive Editor Christopher Koch at ckoch@cio.com.

SPECIAL REPORT

WEB
SERVICES

THE EARLY ADOPTERS

Many companies are jumping into Web services before standards emerge. Sure, there are risks. Here's how some early adopters are managing them.

Motorola has committed to the enterprisewide deployment of Web services, with the full knowledge and backing of Samir Desai, senior vice president and CIO.

Never mind that Web services is still an emerging set of communications protocols that most vendors do not fully support.

Never mind that the fulfillment of the Web services promise to simplify integration depends on standards that today are the subject of rancorous debate by competing vendors and standards organizations. (See "The Battle for Web Services," Page 54.)

Never mind that if an enterprise such as Motorola bets on standards that are eventually abandoned, its dream of communicating cheaply and efficiently with customers and suppliers would turn into a nightmare of expensive changes and upgrades.

After two years of ever-expanding pilots at Motorola, the business benefits of converting hundreds of applications into

ulated Risks

BY ELANA VARON

SAMIR DESAI
CIO, Motorola

"Most cultural change programs fail. Most strategic change programs fail. Most large IT programs fail or underperform. Aggressively adopting Web services at the enterprise level is all three combined. So the most critical decision is to see how not doing this can be competitively dangerous."

Web services and updating the company's underlying IT architecture to support them are, according to Desai, obvious and irresistible.

"This is about increasing the throughput, agility and cost-effectiveness of IT," says Desai. "How many times should I code a credit card check? With Web services the answer is one. In the past no one really knew the answer, but it was a much, much larger number." Merely by automating standard transactions, Web services promises to save a huge amount of effort and money.

This fall, Desai and his team will place bets on a cadre of vendors to supply the platform and tools for a multimillion-dollar effort to develop and operate Web services, both internally and outside the firewall. And as Desai acknowledges, no matter the anticipated ROI, it's still a gamble.

If standards fail to evolve, then the whole effort is cast into doubt. "No Web services standards means no enterprise Web services. It's that important," Desai says. Adds Toby Redshaw, Motorola's corporate vice president of strategy, architecture and e-business,

PHOTO BY JEFF SCIORTINO

"If you back the wrong vendors and the market evolves past you, the vendors go out of business and the whole learning relationship, the whole [return on] investment sort of goes close to zero."

That's just one risk among many. But diverse companies are rolling out Web services in defiance of these and other risks, looking for early mover advantage, ROI projected in the millions, and huge cost savings over developing and deploying software in conventional ways. In a survey that the Cutter Consortium consultancy con-

ducted earlier this year of 250 clients, 13 percent said they were already using Web services for business-critical applications as of last January, while 54 percent said they were developing or prototyping Web services applications.

Early adopters are betting that by investing in multiple standards, performing extra due diligence on vendors and keeping a long-term outlook, the effort will be worth it. Here's how three very different organizations—Motorola, the U.S. Navy and Wells Fargo—are addressing five major

risks of Web services in their deployment strategies.

RISK NO. 1: Web services isn't secure.

MITIGATION: Choose a standard, but be prepared to switch.

Any plan to expose data and applications beyond the corporate firewall carries risk. Web services adds an extra dose of complexity to a company's IS strategy because there are no agreed-on standards for authenticating users and controlling access to Web services applications that are accessed from outside the corporate firewall. So far, that's deterred many organizations from pursuing one of Web services' grandest promises: that trading partners could assemble application components they need to use at the time of each transaction. For instance, a builder could use one Web service to query catalogs from multiple suppliers, and another one to generate purchase orders to send to two of them. Upon receiving the purchase orders, one supplier could use a Web service to access an internal database and confirm that the order comes from a customer in good standing. The other could use a Web service provided by a third party to run a credit check. The software to run each transaction could be reused multiple times without additional programming. But each of those transactions requires a means to verify that the customer is who she says she is, and that she's authorized to do business.

Secure verification hasn't arrived yet, but early adopters have learned that with planning, it's possible to get around that problem. Wells Fargo's Wholesale Banking unit is rewriting 35 online banking applications for corporate customers as Web services. The applications, now available through the bank's Commercial Electronic Office portal, will be broken up into their discrete components so that customers can pick and choose the features they want to use without having to open entire applications to perform individual tasks. For instance, a company treasurer who wants to make an investment could check her account bal-

MONICA SHEPHARD

**Director of C4 and
Combat Systems**

U.S. Navy Atlantic Fleet

"We may have disagreements now about whether a particular effort takes advantage of Web services in the best way possible, but we're not arguing about whether Web services is pertinent to the U.S. Navy."

It's difficult to have short-term metrics for Web services.
At the corporate level, Wells Fargo looks for ROI in the progress made toward sharing customer information among different business units and improvements in levels of service provided to customers.

ances, create a wire transfer, and conduct a trade without having to open and click through three different applications.

The bank has addressed the security conundrum by maintaining its existing methods for customers who want to access its Commercial Electronic Office and transmit data. Customers have to first establish a business relationship with the bank and obtain a user ID and credentials before they can use any online services. Those procedures don't have to change for the bank to make Web services available to customers, says Danny Peltz, senior vice president of Wells Fargo's Wholesale Internet Solutions Group.

The major security challenge Peltz faces—keeping track of which transactions each user is authorized to perform—has less to do with protecting systems and data from unauthorized access than it does with maintaining systems' performance. As each application is currently designed, authorizations are verified when a customer launches the application. Because in the future customers will access Web services instead of launching an application, "the authorization has to travel with Web services," notes Peltz. "You don't want to have thousands of calls to a database each time there's an authorization change." Peltz says he expects to choose an industry standard for managing permissions, but observes "there's no clear road map for how to do it."

It's possible that no standard will address his needs adequately. But Peltz has built into his strategy the time and money to evaluate different options. His first deployment, at the end of this year, will be a new portal server that supports access to Web

services applications through the Commercial Electronic Office portal. Then he'll roll out the actual Web services every quarter through mid-2005. "We're not going to tackle everything all at once," he says.

The Navy, meanwhile, has decided to adopt security assertions markup language (SAML), an emerging standard that supports authentication and authorization of end users. As a member of the Oasis standards body, the Navy has been involved in the development of SAML. "Based on what we know, we think that's a good choice," says Monica Shephard, director of command, control, communications, computer and combat systems for the Navy's Atlantic Fleet. Because Navy personnel are stationed around the globe and support contractors require access to both classified and unclassified information, Shephard says a standard sign-on capability managed as a reusable Web service is essential to ensure that everyone who needs access gets it. And that those who don't, don't.

If the market takes a different tack and the Navy decides to change protocols, Shephard would follow change management policies set out by the Navy's CIO, David Wennegren. To facilitate technical changes, the Navy has spent about \$1 million to develop what it calls a "portal connector," a middleware layer that lets the Navy substitute standards or data definitions without forcing changes to user services or to underlying databases. Shephard has already been through one forced technology change—the choice to adopt new portal software, made by managers of the Navy's enterprise network, the Navy Marine Corps

intranet. With that experience behind her, she is confident that she can change Web services standards successfully, if need be.

RISK NO. 2: The lack of standards breeds complexity.

MITIGATION: Support multiple standards for now.

The users of my information and my services and my architectures are frequently disconnected, often have extremely small bandwidth, and have to do business in real-time with organizations that are dispersed globally," says the Navy's Shephard. A big benefit of Web services is that those disparate groups—whether a land-based command center or a battleship—can easily access centrally managed data. But there's no consistent way to deliver that information through the many proprietary portal platforms Navy users have deployed.

A standard called Web services for remote portals would provide a common way to plug Web services into any portal, but it's still under development by Oasis. As part of the Navy's coping strategy, it's using its market power (the Navy spends \$1 billion a year on its intranet alone) and influence with standards organizations to cajole vendors into supporting as many of the emerging standards as possible. The Navy calls its strategy "vendor neutrality" because it presumes infrastructure vendors will eventually provide products that will work with any standard and therefore will be easy to integrate.

"It's a difficult strategy for the short term, and the most powerful strategy for the long term," says Shephard. In the short

term, Shephard's staff has to put extra effort into making Web services work in a non-standard environment and keep up with technical details. The alternative—picking a few software products that every Navy unit would use—would ultimately be a more difficult strategy to execute, says Shephard, because it would risk getting stuck with proprietary software. "Then we would be tied to a single view change and a single company's ability to generate new and inventive ideas," she adds. In the meantime, the Navy is using its portal connector to facilitate integration between Web services and proprietary applications.

For Motorola's Redshaw, that strategy of covering your bases with multiple standards extends to the choice between Microsoft's .Net and Sun Microsystems' J2EE as development platforms for Web services applications. In his view, there isn't really a choice: Most companies, he thinks, will have to invest in both, as Motorola has. "It's strategically dangerous to go down one path or another," says Redshaw. Most established companies already use J2EE, he notes, but "if you say, I don't like Microsoft, and get stuck in stupid politics, you may get leapfrogged."

While it's hard to know exactly how

much it's going to cost companies that maintain both platforms, Tom Welsh, senior consultant with Cutter, says to plan for purchasing software and servers to support both environments, as well as staffing up with trained programmers. "Few people are dynamic enough to be conversant in both .Net and J2EE," notes Welsh. It's also necessary to account for the cost of managing and maintaining the two platforms. Yes, those costs add up, but as Welsh says, "It's a mistake to hope for the benefits of IT when you grudge the time, money and sheer effort necessary to understand what it's all about."

How to Build Securely on Shifting Sand

Five best practices for successful Web services projects

1 Pilot, pilot, pilot (and plan to screw up).

If you haven't been experimenting with Web services in the past two years, don't rush headlong into an enterprise deployment. "If there is one single factor that can help you minimize your risk, it's understanding what you're doing," says Tom Welsh, senior consultant with the Cutter Consortium consultancy. "There are tremendous amounts of people running into production with things they don't understand."

Toby Redshaw, corporate vice president of IT strategy, architecture and e-business for Motorola, advises doing multiple prototypes to see where Web services offers the greatest bang for the buck—and making sure everyone knows some tests might fail. "I have a pilot that's an absolute disaster," he says. "Occasionally, we're going to have blowups like that."

2 Focus on architecture.

"You'd never let anyone build a house without a blueprint," observes Redshaw, and by the same token, you need a service-oriented architecture, which is designed to facilitate connection of software components, to deploy Web services most effectively.

As with many infrastructure investments, the ROI isn't readily apparent. "In the past 20 years, IT was built to last, but in the next 10 years, the goal is building IT to change," says Brand Niemann, a computer scientist who heads the federal CIO Council's XML Web Services Working Group. "You won't see the cost savings [of a service-oriented architecture] initially, but in the long run, it's cheaper and creates a more agile organization."

3 Remember that nothing is set in stone.

Standards are fluid, software is maturing, and the Web services you deploy now may have to be rewritten sometime in the future. "You're guessing the benefits outweigh the cost of recoding," says Whit Andrews, research director with Gartner.

4 Involve the business.

Every Web service is a component of a business process. Monica Shephard, director of command, control, communications, computer and combat systems with the Navy's Atlantic Fleet, has business managers decide which applications to convert to Web services and which legacy applications to kill. Some legacy systems will die a natural death, she says, but "sometimes the right thing to do is wait" until users have

time to revamp their business processes to accommodate the new environment.

5 Communicate with your IT team.

By its nature, Web services is interdependent, and unless all your software developers are subscribing to the same programming principles, you'll end up with a mess of systems that won't interoperate. For instance, everyone should use the same protocols and access databases the same way, says Danny Peltz, senior vice president of Wells Fargo's Wholesale Internet Solutions Group. Educating developers about new data and communications protocols is being handled by Wells Fargo's Enterprise Architecture Group through published documents, brown bag lunches and the existing process for reviewing new software. —E.V.

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RISK NO. 3: Vendors might go out of business.**MITIGATION: Look past a vendor's software to its management.**

As with any emerging technology, not all of the software you need can be purchased from well-established vendors. There's a risk that you could choose a vendor that goes under or a product line that doesn't survive.

"Theoretically, you'd say you have to let this space mature, you have to let the rate of change amongst the vendors slow down, and you have a much higher chance of picking the right choices," says Motorola's Redshaw. "It's nice, safe, probably a good approach for some companies. But if you're using old 'me too' technology, someone who is several steps ahead of you may have com-

test, the major software vendors probably understand Web services technology best, even if their products aren't mature. Working with companies that aren't well established also requires some extra effort. "You have to really play a partner, if not 'big brother' role," adds Desai. "In many cases where we think it is strategic to IT, we become an owner as well as a customer."

However, there are some risks Redshaw isn't willing to take. A vendor's lack of attention to security, he says, "is a deal-breaker." Vendors must address how they plan to maintain security as their software passes data to another vendor's application. "If you have a serious enough gap there, you just walk away," he says.

Whit Andrews, research director at Gartner, adds that a critical factor in the choice of vendors should be whether they are driv-

the potential points of failure are multiplied. The vision of Web services as a way trading partners could "discover" and use externally published components has generated a lot of hype, but it's far from reality. Nevertheless, early adopters anticipate benefits to using Web services with external partners. The key: Don't rely on anyone else to supply any Web services you need to execute a transaction.

Wells Fargo learned from its experience in rolling out its Internet applications that customers "don't care about the technology," says Steve Ellis, who heads the Wholesale Banking unit, as long as the bank provides reliable and convenient service. So he and Peltz see little need to push customers to adopt simple object access protocol for sending XML messages, or even to send XML messages at all. Instead, the bank will

Diverse companies are rolling out Web services in defiance of the risks, looking for early mover advantage, ROI projected in the millions, and huge cost savings over developing and deploying software in conventional ways. Early adopters are betting that by investing in multiple standards, performing extra due diligence on vendors and keeping a long-term outlook, the effort will be worth it.

petitive advantage." Redshaw is willing to accept, as the premium Motorola pays for being an early adopter, the possibility that some of the vendors he picks may not survive.

To mitigate that risk, Redshaw recommends that companies look past the capabilities vendors offer in their current products and conduct due diligence on their R&D plans. "The tricky part is to look under the covers, to see what their underlying architecture is," he says. "We're trying to pick the horse that's going to win 20 races over the next two seasons."

To this end, Redshaw scrutinizes the vendor's middle management. "Who's running R&D? If those guys really get it, I have a more comfortable feeling," he says. By this

ing the development of standards "or being driven by them." He advises picking vendors that have a financial stake in the outcome of the standards battles.

RISK NO. 4: Adoption by partners is unpredictable.**MITIGATION: Deploy robust middleware that can translate a variety of formats.**

If you build a Web services application, will anyone use it? That's a risk you take when you develop a process that's meant to be used by a trading partner. It's one thing to adopt new technology yourself—another to expect customers and suppliers to make the same investments. And when you rely on trading partners to supply Web services that are critical to some business process,

accept messages in any format and convert them to XML for use by the Web services that apply EAI tools.

"We see this as one of a suite of formats," says Ellis. "How people connect, we expect that to evolve over time. We have 30,000-plus companies we work with with different expertise and skill sets." Donie Lochan, vice president with the Cap Gemini Ernst & Young Financial Services Consulting Group, says Wells Fargo's strategy will be a common one as Web services is offered externally. "There's a large cost to develop common middleware across an enterprise," says Lochan. "But if you didn't have that, you would need to go and rewrite a lot of the mainframe applications that you have to expose them securely."



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It's also necessary to think hard about how to maintain systems' performance when Web services applications interact with each other, says William Wood, executive vice president for enterprise business services and information management with Wells Fargo's IT organization, Wells Fargo Services Co. "To manage end-to-end availability, you're only as strong as the weakest link, so capacity and performance planning and really understanding what service levels are provided needs to be a very big focus," says Wood, who oversees Web services investments at the enterprise level. That's easier to do yourself than if you're depending on external trading partners to provide Web services.

RISK NO. 5: No evidence yet for enterprise ROI.

MITIGATION: Think long term.

While evidence is emerging that companies already have realized benefits from their investments in Web services, enterprise-level ROI is still largely theoretical. Leading organizations currently report their gains in terms of the time and money saved on application development, says Cap Gemini's Lochan. Such savings can be impressive—the Navy lopped more than \$8 million a year from the cost to manage just one operation planning application as a Web service, and can now develop new applications in a few months instead of years. The Navy also reports improvements in strategic processes such as mission planning due to Web services that, for instance, enable the aggregation and centralization of mission-critical weather reports.

While it's taken a year and a half to whit-

tle 100,000 applications down to 6,000 Web services, Shephard anticipates it will take several more years to reach her ultimate goal of a few hundred Web services. Because technological change is driven by fundamental changes in how the Navy operates, the business value of Web services is dependent on how commanders execute their mandates to collaborate more closely. Getting top Navy leaders to buy into the potential of Web services was one of Shephard's biggest challenges. "We may have disagreements [now] about whether a particular effort takes advantage of Web services in the best way possible, but we're not arguing about whether [Web services] is pertinent to the U.S. Navy," she says.

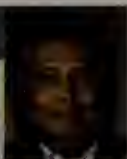
Wells Fargo's Wood notes that "it's difficult to have short-term metrics" for Web services. Wells Fargo doesn't even maintain a separate budget for its Web services investments, instead incorporating them into its IT architecture budget. At the corporate level, Wood looks for ROI in the progress made toward sharing customer information among different business units and improvements in levels of service provided to customers. When it comes to specific projects, Peltz says he'll keep investments under control by developing new services in short, iterative cycles rather than sinking a lot of money into big projects. And he'll tackle first the projects that customers want the most—services like event messaging (customized notifications about payments received or other financial events) and payment transactions.

Becoming an early adopter of Web services is not an easy road. "Most cultural change programs fail. Most strategic change programs fail. Most large IT programs fail or underperform," says Motorola's Desai. "Aggressively adopting Web services at the enterprise level is all three combined. So the most critical decision is to see how not doing this can be competitively dangerous." **CIO**

If you're an early adopter, tell Senior Editor Elana Varon about your experiences. You can reach her via e-mail at evaron@cio.com.

Talk to Samir Desai

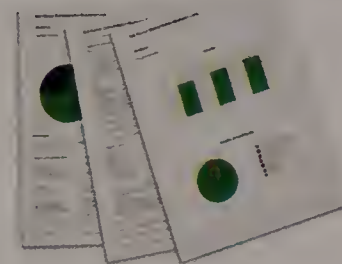
The senior vice president and CIO of Motorola has plunged into the fray with an enterprisewide deployment of Web services. How's it going so far? What has he learned? Just **how does one deploy Web services?** Through Oct. 15, you can **ASK THE SOURCE** as Samir Desai answers your questions on Web services. Go to www.cio.com/ask. **CIO.com**



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It Ain't Over...

UNTIL YOU DO THE POST-IMPLEMENTATION AUDIT

Scrutinizing every aspect of a finished project and acting on the lessons learned can be controversial and difficult. But post-implementation audits are an important way to avoid repeating costly mistakes.

BY MERIDITH LEVINSON

Reader ROI

- ▶ Why post-implementation audits are valuable
- ▶ Learn from companies doing it right
- ▶ Overcome resistance to PIAs in your organization

AS soon as Michael Baker Corp.'s IT department finished installing a Web-based procurement system from ePlus, Bruce Higgins, CIO of the \$405 million engineering and construction company, was bombarded with inquiries from colleagues about the system's effectiveness. He had ample anecdotal evidence suggesting that orders were getting turned around more quickly, but he didn't have tangible proof that the system was improving efficiency.

So he decided to conduct his first ever post-implementation audit (PIA) of the new system. A PIA is a top-to-bottom evaluation of the hard and soft benefits derived from a strategic information system, the security of that system and the project management process for deploying it. From the PIA, Higgins learned that because IT miscalculated the number of people needing to use the new system, the ROI was driven down by the cost of ordering additional licenses. The PIA also showed that the system was saving the company more than \$150,000 yearly, however, so Higgins was able to prove the system's worth to his colleagues. And he learned some valuable lessons on what not to do on subsequent projects.

CIOs would do well to follow Higgins' lead in realizing that a PIA is a worthwhile way to prove the value of IT. But many don't. In fact, Barbara Gomolski, a research director with Gartner, estimates that a mere 20 percent of companies take the time to conduct PIAs.

Companies avoid post-implementation audits for many reasons: They take too much time and drain away valuable personnel resources—two things currently in short supply. They require reams of documentation so that processes and results can be validated. Finally, project sponsors and

implementers fear that the results of an audit, if unfavorable, will be used against them.

The CIOs at companies successfully performing audits have identified critical success factors, including: getting the right people involved, timing the audit properly, and collecting enough documentation to facilitate the smooth execution of a PIA. They pick the right projects to audit (for more information on this, see "How to Select the Right Project for Your First

Post-Implementation Audit" at www.cio.com/printlinks). And these CIOs share several key traits on how they ensure that PIAs become a sustained practice in their organizations: They are all committed to continuous improvement, they've made PIAs a part of their project management methodologies, and they have their CEOs' support.

But companies not performing PIAs are missing out on the important benefits such data provides. Although the challenges and risks associated with PIAs seem formidable, 66 percent of this year's CIO 100 honorees always or frequently conduct them, according to a CIO survey. Since the



Bruce Higgins, CIO for Michael Baker Corp., says that post-implementation audits help him prove a system's value. They also yield lessons for the next project.



According to Jim Smith, CIO of Sun Life Financial, post-implementation audits give IT a valuable tool for helping business units understand where their dollars are being spent.

honorees were chosen for their exceptional resourcefulness, their prevalent use of the audit establishes it as a best practice among highly effective organizations. PIAs provide a thorough approach for proving the value of high-cost, mission-critical IT investments and for gleaning project management best practices, which CIOs can then apply to keep subsequent projects on track. At a time when the value of CIOs, IT departments and IT investments are under increased scrutiny, PIAs are now more critical to CIOs' success and survival than ever before. "With the pressure on business today and the responsibility of IT to help the business units

understand where their dollars are being spent, I really have trouble with anyone saying you shouldn't be doing [PIAs] in this [hard economic] time," says Jim Smith, CIO of Sun Life Financial and a strong advocate of PIAs.

How to Overcome Resistance to Audits

Many CIOs and their IT organizations shy away from audits because they think they'll be scapegoated if the audit reveals problems or lack of ROI. That's why Michael Barilla, vice president for business information serv-

ices of Greif, a \$1.6 billion manufacturer of industrial and paper packaging, frequently reminds himself and his IT staff that systems implementations and software deployments are not IT projects, but business projects. So if a project fails, he says, "it's going to fail as a team," and everyone—not just IT—will be accountable.

Gartner's Gomolski concurs. If an audit exposes a shortcoming, she says, that problem shouldn't only reflect on IT, especially if the project was jointly sponsored by the business, IT and finance.

"Exposing problems can be a double-edged sword," says Gomolski. "But it's better to be proactive. If you haven't achieved the value you thought you would, figure out what you can do to change that."

Another common concern about PIAs shared by CIOs, IT employees and even businesspeople is that they suck up too much time and require too much toil. But companies that perform PIAs say they shouldn't—and don't—take a lot of time to execute. Honeywell Aerospace aims to spend no more than seven to 10 days conducting an audit, and Sun Life Financial tries to complete PIAs within two weeks.

Furthermore, CIOs who conduct PIAs say the time and resources audits use get recouped on subsequent project implementations. Resistance to audits also often stems from a desire to be rid of a project once the deployment is complete and to move on to the next challenge. The trick is to make it easy for workers to conduct and provide feedback for PIAs. For example, when Sun Life Financial's IT project office needs to solicit feedback on a system from business users, it asks them to fill out an electronic survey, on their own time, that takes no more than 20 minutes to complete. The response rate for those surveys is usually better than 50 percent and is sometimes close to 100 percent, says Ed Esposito, director of the project office.

Because Honeywell Aerospace's IT organization for its Aviation Aftermarket Services unit also has trouble reengaging business users in a project during an audit, the IT

organization leverages its staffers who have completed training in Six Sigma, a process improvement methodology. Those with Six Sigma training, who are experts in business processes, provide the IT department with the feedback it needs to determine whether a system has streamlined workflows.

Engage the Right People

Who should perform PIAs is a matter of great debate. The most common groups of workers include one or more of the following.

- Members of the project implementation team from IT
- Members of the project implementation team from both IT and the business
- Representatives from a company's internal audit department

At Sun Life Financial, IT's project office leads the PIA process on its own IT and non-IT projects. But it does so in conjunc-

It's better to have a group of people from different functions participate in the audit rather than just an IT team.

tion with the finance department and the company's internal audit department. IT projects are audited from the beginning and on an ongoing basis, rather than at the end of an implementation, which ensures that IT follows sound project methodologies, meets user requirements, stays on budget and implements proper security controls.

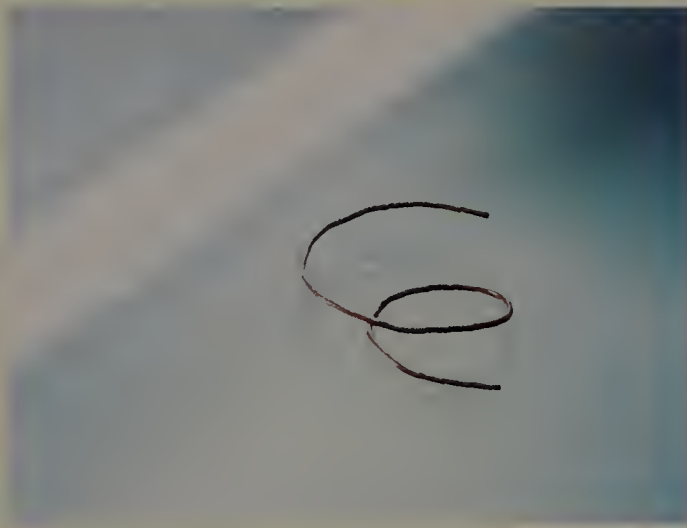
Sun Life Financial's approach comes closest to being the best, according to PIA experts. Don Christian, a partner with PricewaterhouseCoopers, says the PIA team should consist of a businessperson and an IT person who were involved with the implementation, and that it should be led

by someone independent, such as an internal auditor, who was not part of the project team. Christian says it's better to have a group of people from different functions participate, rather than just an IT team or just internal audit because they all provide valuable input. The advantage of having members of the IT project team involved is that they're intimately familiar with the benefits, deliverables and requirements of the project. And because they know the project so well, it is easier for them to fully evaluate a project. Having a businessperson on the audit team is important because she can more easily determine if an external factor

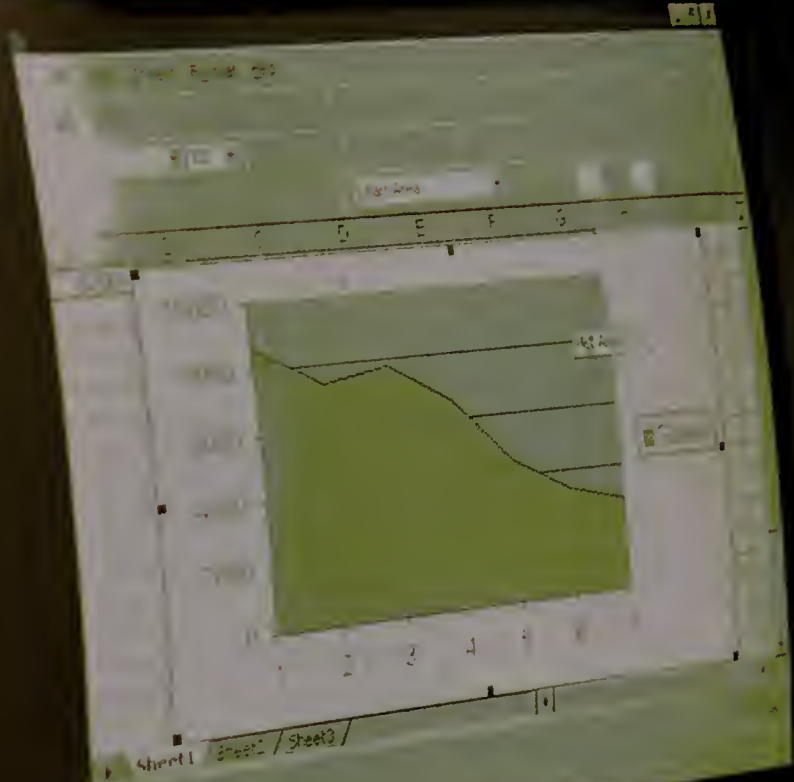
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rather than a systems failure is causing a system to not generate expected value. And an independent auditor is important because he's not afraid to ask tough questions and will prevent the members of the project team who are involved in the audit from softening any findings.

Time It Right

When to conduct an audit, just as who should lead it, is a matter of debate. When to start depends on the type of system or application deployed, the amount of time it will take before the application begins generating some results or data, and the amount of time it takes staffers to get acclimated to the new system and new processes. Generally the audit should take place well within a year of implementation.

"When we started the audit a month after the implementation, we didn't have

"Exposing problems can be a double-edged sword. But it's better to be proactive. If you haven't achieved the value you thought you would, figure out what you can do to change that."

—Barbara Gomolski, research director, Gartner

enough data to see if the system was successful or not," says Michael Baker Corp.'s Higgins. "It's really important to make sure the system is up and running long enough to have enough data in the system that you can analyze."

Ken Cunneen, IT leader for technology and integrated supply chain systems in Honeywell Aerospace's Aviation Aftermarket Services division, says if a company implements a financial system that only gives

results once a quarter, the audit team should wait at least three to six months until the system has generated enough data before performing a PIA.

On the other hand, the sooner you start the audit, the fresher the data and the easier it is to cull lessons learned. Which is why PIAs should not be a onetime event, says PWC's Christian.

Sun Life Financial's project office begins PIAs within a month of project completion

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Eight Steps for a Successful PIA

1 Long before the post-implementation audit (PIA) begins, **write up a clear business case** that delineates and breaks down the cost of the project, the soft and hard benefits, the expected ROI, and when the ROI will be fully achieved.

2 **Keep scrupulous records** of all the changes that are made to the system and to the project plan during the implementation. A Web-based version control or collaboration tool can make this easier.

3 **Identify the members** of the audit team.

4 **Schedule a kick-off** PIA meeting to identify all the logistics that need to take place to perform the audit.

5 **Review the business case**, the initial scope of work and all the change orders. Around the same time, schedule interviews with users or send out satisfaction surveys. Also survey implementation team members to find out how well they think the various project objectives were met. Test the system and its controls. Examine the quality of the data. Take a sample of the transactions to make sure they're being processed the way they should. Engage the finance department to conduct its review of the system's payoff.

6 **Compare audit findings** with the business case to see if you hit your target.

7 **Gather lessons learned.** Identify what went well, what didn't and why. Determine how you can address what didn't go well in future implementations.

8 **Perform follow-up reviews**, if necessary. —M.L.

to do a postmortem on the implementation process and to get feedback from users to make enhancements to the system. "When we have benefits that are realized over a period of years after the project is implemented, we do follow-up reviews," says Sun Life Financial's Esposito.

Higgins plans to take that iterative approach with Michael Baker Corp.'s ERP implementation, which is scheduled to be completed by the end of this year. "We will begin to audit the effectiveness of the new system within a couple of months after we finish implementing it," says Higgins. "Then we'll probably start to look at the ROI six to eight months after we go live so that we have enough data to perform a good analysis."

Maintain Meticulous Documentation

Another key to successful PIAs is good documentation, which takes many forms. It includes the business case that outlines the system's expected cost, benefits and ROI; the project's time line, including key metrics and milestones; a breakdown of the system's technical requirements; a record of the security and financial controls that have been put inside the system; and a compendium of all the changes that have been made to the system or project plan. But getting good documentation is one of the biggest challenges CIOs and IT departments face in conducting PIAs, particularly if they're doing one for the first time.

Sharon L. Thompson, director of IT audit for the AARP, says that if an auditor discovers that the implementation team does not have a thorough business case, a detailed project time line or meticulous records of changes and security controls, the auditor should note that discovery in the audit report and include a recommendation for the implementation team to keep better records.

To make life easier for himself and his post-implementation auditors, Higgins uses a Web-based collaboration tool called

MPOWR—developed by members of his IT department to do version control and to archive changes made to the project's scope, templates, time line and budget. When it comes time to do a PIA, Higgins sends the auditors a link to the MPOWR site with a user name and password.

Sun Life Financial's IT project office also developed a project portfolio management system in-house that the project manager uses to report on a monthly basis changes to a project's cost, milestones and schedule.

Act on Lessons Learned

If you don't use PIAs to identify ways to improve project management, you're not realizing their full value. Sun Life Financial's Esposito says project team members who served on the audit and implementation teams hold a meeting during the PIA process to discuss what went well and what went wrong both during the implementation and the audit, and to identify areas for improvement.

To ensure that people take these lessons to heart, Sun Life Financial posts them on the corporate intranet and submits to senior management a summary of findings from PIAs of all projects done during the course of the year. Esposito also makes changes to project management and implementation processes if a project's PIA indicates that changes are warranted.

Sun Life Financial annually reviews the audits of different projects to identify common areas that need improvement. Gartner's Gomolski says it's important to do this type of project-to-project comparison. "The real value," she says, "is in seeing

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some of the patterns. For example, 'We screw up every time we do an integration project. What does that mean?' Or, 'Every time we do a project with this business unit, we suffer from amazing scope creep because they don't really know what they want, so maybe we have to work with them differently.'"

Sustain the Momentum

Now that you're armed with convincing arguments on the importance of PIAs and success factors for pulling them off, making them a sustained practice in your organization should look less daunting.

"If you have the project's objectives, approach, how it's going to be organized, how the business areas are involved in the project, the expected costs, and the anticipated hard and soft benefits well-defined up front, and you manage change along the

"If you have the project's objectives, approach, how the business areas are involved in the project, the expected costs, and the anticipated benefits well-defined up front, then when you come in to do the post-project audit, there are no surprises."

—Ed Esposito, director of Sun Life Financial's IT project office

way, then when you come in to do the post-project audit, there are no surprises," says Esposito.

Not only do PIAs go smoother when you've done all the hard work on the front end, but you increase your odds of actualizing the system's value. "By getting a better

understanding of project costs up front," says Higgins, "you'll be more likely to hit the ROI you're trying to meet." **CIO**

Are you afraid of post-implementation audits? Tell Senior Writer Meridith Levinson via e-mail at mlevinson@cio.com.

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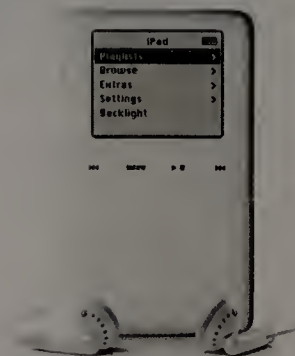


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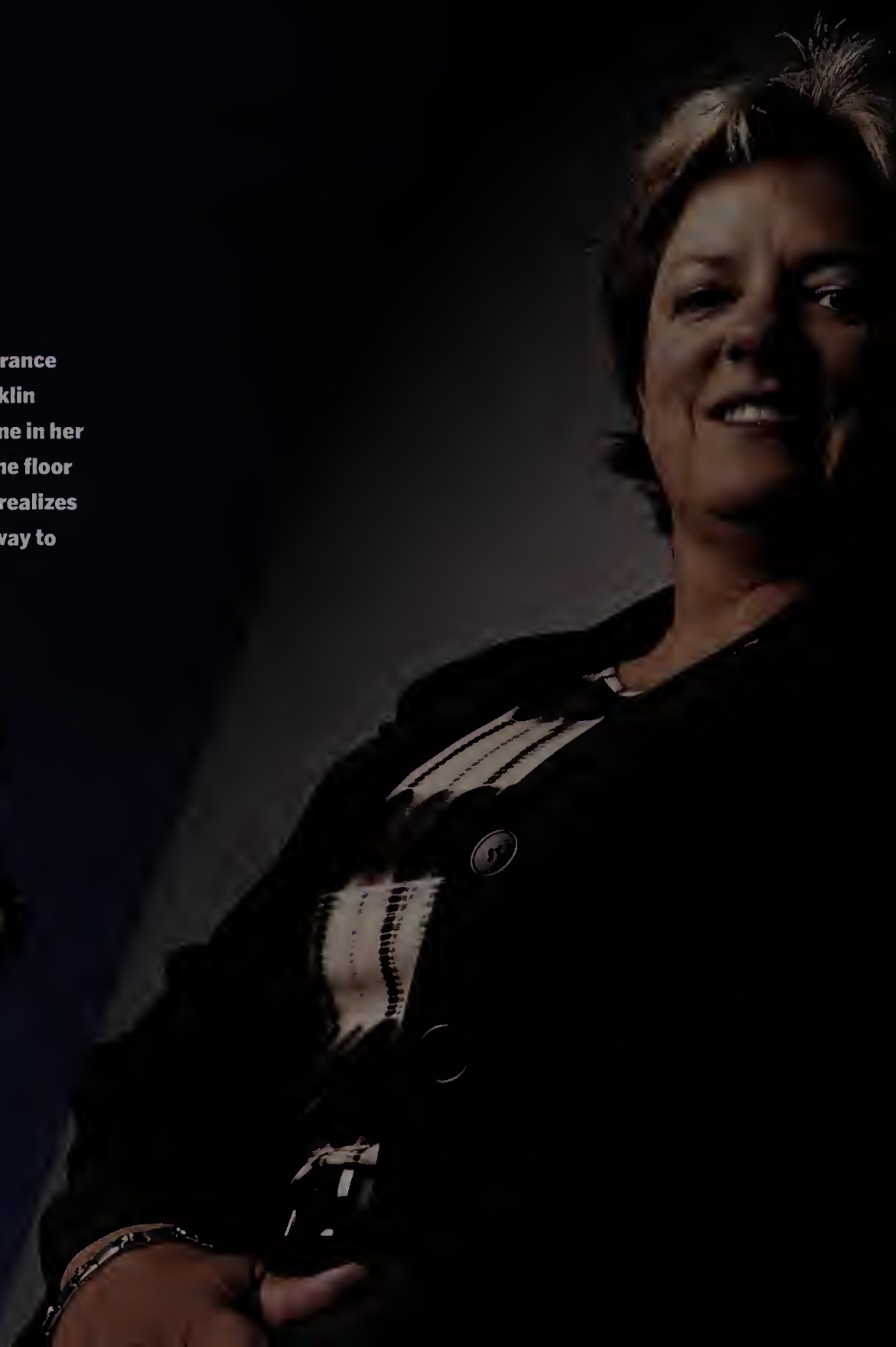
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THE BUSINESS EDUCATION OF JAN FRANKLIN

Just when she thought she knew everything, this IT veteran spent some time on the business side. What she learned there prepared her to take over as Farmers' CIO when opportunity knocked.

BY ALICE DRAGOON

JAN FRANKLIN WAS 17 WHEN SHE LANDED HER FIRST JOB AT FARMERS INSURANCE AS A KEYPUNCH OPERATOR on the 4 p.m. to midnight shift. Within two years, the driven college student got herself promoted to a programming job, launching her steady ascent up the IT ranks. Fast-forward to 2001, and Franklin had become vice president of IT applications and development, overseeing a \$300 million budget as IT chief operating officer. At that point, she knew pretty much everything there was to know about IT at Farmers, having done most of it herself.

But Franklin had the good sense to know what she lacked: direct business experience. So she ventured outside the realm of IT to ask then Executive Vice President of Property and Casualty Stephen Leaman to be her mentor. When he suggested a tour of duty on the front lines of the business to round out her experience, she readily agreed. So Leaman put a bug in CEO Martin Feinstein's ear. Having served as CIO himself

Reader ROI

- ▶ How time on the business side can benefit you
- ▶ Recognize the value of listening to your users
- ▶ Realize the importance of looking beyond metrics

in the early '90s, Feinstein understood that letting Franklin broaden her horizons would make her a more valuable employee—and knew that IT would benefit from having a scout on the business side. Franklin would be able to identify opportunities to apply IT strategically and get a chance to view IT from a user's viewpoint. When the business-side position of executive director of the Los Angeles Service Center (LASC) became available in September 2001, Leaman called Franklin in London, where she was celebrating her 10th wedding anniversary. Was she interested? Absolutely. Three weeks later, she found herself heading up one of Farmers' largest service centers—leading a staff of 550 who do underwriting and provide administrative support for up to 5,000 agents who sell Farmers insurance.

The lessons Franklin would learn in the trenches not only made her a more savvy businesswoman but also gave her an appreciation for how customers of IT really use technology. Those lessons serve her well today because, as fate would have it, the CIO spot did open up in March 2003, when Cecilia Claudio left to head up IT for Europe, Asia and Africa for Farmers' parent company, Zurich Financial Services. And when Franklin got tapped to fill it, she was

more than ready. Here she shares four lessons that she learned on the other side of the fence.

Lesson

1

Take the Time to Walk the Floor and Listen

FRANKLIN WAS ALWAYS KNOWN AS A no-nonsense, bottom-line manager with little patience for office politics or excuses—and often little patience for listening. She had so much experience that she could act quickly and decisively. Markus Nordlin, vice president of IT strategic projects, recalls that after a short time of listening to a problem, she'd say, "You guys are idiots. This is the way it's going to be." While she always did this with her tongue planted firmly in cheek, says Nordlin, her good-natured conversation-stopping technique did have the desired effect of, well, stopping conversations.

But when Franklin got to LASC, she had no choice but to learn. She was charged with supporting the agents, with whom she had not worked directly and over whom she had minimal control since they weren't on the payroll. In Franklin's second week on the job, she realized she had to get herself up to

speed, so she set aside every Friday to meet with at least two district managers and as many agents as she could. "I was right in front of agents to hear what they thought of our systems, of the products we produce, and what their issues and concerns were." And soon, the listening paid off: Agents started calling to let her know that certain processes were not working properly or to ask her to do something about a form, for example, that had been typed in 1972 and was still being photocopied and sent to clients with handwritten annotations. Talking directly to agents "helped me in running the service center," she says. "It also helped me understand how building these relationships was something I should continue to do wherever I was."

Franklin learned so much on her Friday road trips that she suddenly understood the value of talking to the people on the front lines. "It was a shock to me how much [my job at LASC] was relationship-building as opposed to just fixing bugs," she says. Now that she's CIO, Franklin schedules time to walk the floor because she realizes it's the best way to connect with employees.

Getting the IT staffers in the habit of regularly listening to their business counterparts is also a new priority for Franklin. Instead of focusing just on IT's two primary customers (the heads of personal and commercial lines), Franklin and her IT team created a relationship manager program. She assigned one of her staff to most of IT's 30 key business partners and brought in trainers to build their consulting skills. Relationship managers meet monthly with their business partners to discuss business issues and opportunities to apply IT. With this program in place, the business managers now have an easy way of communicating with IT and getting what they need.

Franklin and her team also developed a solution provider program, whereby IT staffers with advanced skills are assigned to help business units address specific needs. If a relationship manager sees an opportunity to use IT strategically (say, to streamline accounting reports), a solution provider

The Softer Side of Jan Franklin

A stint on the business side taught Farmers' CIO about the importance of building relationships

WHEN JAN FRANKLIN got called back to the home office to become CIO of Farmers Insurance (as well as the local CIO for the North American consumer business of Farmers' parent company, Zurich Financial Services), her direct reports at the Los Angeles Service Center (LASC) made up "I Survived Jan" T-shirts. But they also gave her roses and attached a lesson she'd taught them to each flower. "She was the hardest person I ever worked for," says Mary Monesi, accounting manager at LASC. "But she taught us. She made us look for results." Franklin carves out time to mentor her employees, holding regular leadership meetings to discuss the latest management theory or walk through a financial statement. Attendance is optional, but the meetings are always packed. Morale is also important to Franklin, who gamely sat in the dunking booth at a carnival she organized for agents and threw an employee appreciation picnic for 500 in the LASC parking lot. Monesi says of working for Franklin: "She made me a better person."

—A.D.

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team is called in to help. Team members work on the project on their own time but get an opportunity to develop their skill sets. And IT benefits by building a more experienced staff (and by not having to shell out money for outside consultants).

Lesson 2 IT Metrics Can Help the Business Too

AS AN I.T. VETERAN, FRANKLIN THINKS in terms of metrics, process, discipline. But at LASC, she found “less rigor, not a lot of metrics or process documentation. It was all in people’s heads. It was a culture shock.” In fact, when she first walked into the Simi Val-

seven days. “It took us six months to get relatively accurate with it,” she says. “But even just by starting to measure, there were improvements.” Under Franklin’s watch, service levels improved more than 20 percent. “It was just rigor,” she says. “Me taking what we typically do in IT—process, metrics, discipline, rigor—and applying exactly the same things.”

For an IT pro like Franklin, automating the LASC was a bit like Tiger Woods playing a round of miniature golf. Franklin managed to reduce costs by more than 10 percent overall by implementing an electronic fax management system, loading paper commission reports into Excel, imaging paper files, investing in PCs and sending e-mail bulletins instead of paper flyers to

the error, how they have to deal with customers and do rework to fix it. That was the big ‘aha.’” But because some mistakes are inevitable, she’s instituted clean-up processes to mitigate the impact to the service centers. This fact hasn’t escaped the CEO’s notice. “Jan is much more sensitive when something goes bump in the night than she might have been previously because she had to experience the other end of it,” says Feinstein. “She knows what it does to the business.”

Franklin’s firsthand experience also gives her a better sense of how agents will respond to the eAgent portal that IT recently rolled out—and helps her put the systems’ metrics in context for her staff. Whereas she might once have overestimated

the importance of a metric, such as average transaction time, to gauge a system’s success, she now knows to delve deeper. “You guys don’t get it,” she’ll say to her staff. “Average transactions aren’t what agents are feeling. I was in an agent’s office, and it took over a minute for that transaction to complete. It’s just too slow out there, and they’re not going to

use it.” If agents revert to their green-screen terminals instead of using the portal, they won’t get real-time alerts when customers are about to cancel or haven’t made their payments. And all the work that IT put into developing the system won’t matter.

“In the service center, you see the impact of the IT error. That was the big ‘aha.’”

—Jan Franklin, CIO, Farmers Insurance

ley service center, she might have been stepping back in time. A vast sea of decades-old Steelcase desks awash in paper stretched out over four floors, each the size of a football field, and green-screen terminals topped most of the desks. Most processes were paper-based and hadn’t changed in 20 years; hardly anyone used e-mail. Franklin quickly realized she had a rare opportunity to cut costs and improve efficiency dramatically by eliminating or automating non-value-added tasks. She simply needed to introduce the rigor and metrics of IT along with some basic, low-cost technology.

A math major in college and a self-professed metrics manic, Franklin worked with the LASC staff to figure out what to measure. While the concept of measuring took some getting used to for some employees, they came up with specific goals, such as to answer 80 percent of calls within 20 seconds and get 90 percent of the work out in

the agents. Factoring in savings by consolidating accounting and commercial-loss-control staff for all of California into LASC, she saved a total of \$3.3 million during her tenure.

Lesson 3 Metrics Don’t Always Tell the Whole Story

WHILE METRICS YIELDED IMPRESSIVE results at LASC, Franklin also realized that they don’t always tell the whole story. Her tenure on the business side gave her an opportunity to feel the pain of a system hiccup in real life. “When you sit here in IT and an error occurs, you say, well, that error affected 5,000 out of the million or so transactions we processed yesterday. Big deal. It’s less than half a percent,” she says. “In the service center, you see the impact of

Lesson 4 Coaches Get Better Results Than Drill Sergeants

FRANKLIN’S COMMAND-AND-CONTROL management style had always served her well in IT. And when she got to LASC, she soon had reason to apply it. Within a month of her arrival, Franklin was hearing repeated complaints from agents about one of her functional areas. Calls weren’t being answered promptly, documents weren’t getting out on time, forms were lost, and claims were mispaid. Franklin attacked the

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problem with her tried-and-true militaristic approach. "I sat down with staff members and said we would have it fixed by this date, come hell or high water," she recalls. Within three months, they'd addressed many of the service problems, but a staff survey also revealed that morale was horrible. Franklin realized that to sustain the improvements and to make further progress, she'd need to shift to a participative management style. So she gathered the troops and explained why she handled the problem the way she did: She'd wanted to

say she's a better listener. "Before, she'd just cut you off, saying, 'You don't get what I mean.' Now she'll listen to you go through your little diatribe of why things are the way they are," says James Fridenberg, vice president of IT applications and development.

Recalling Franklin's pre-LASC days, Nordlin says, "when a situation would arise, Jan would listen real quick to understand it, make a decision, and off she'd go. She was comfortable doing that and generally was right." But given the same circumstance today, "she is much more likely to call in

"Now Jan is much more likely to consider individuals' input before making a decision."

—Markus Nordlin, VP of IT, Farmers Insurance

turn the organization around quickly. The staff then told her it would have been easier to take if she'd explained what she was doing up front. Franklin got the message and switched into collaborative gear, putting the ball in their court to suggest and sustain further improvements. Employee morale improved, says Franklin, and in a survey of agents some six months later, this functional area was rated one of the better groups at LASC.

These days, Franklin rarely calls on her command-and-control tactics. Her reports say that her style is collaborative, and she's more likely to coach than dictate. They also

the various parties, hear various sides of the story, and consider individuals' input before making a decision."

From Feinstein's point of view, Franklin's stint on the front lines allows her to bring more value to the table as a senior executive at Farmers. "Jan can now provide greater insight and advice as to where we should focus our attention," he says. "She has the ability to step back and say, 'Let me share with you where you're going to get the advantage.' I think that's something she's been able to learn as a result of being on both sides."

Now that she's on the IT side of the fence, it's a standing joke with her staff that she's no longer allowed to say, "When I was in the service center...." But, of course, Franklin does regularly draw on those experiences, and she's a better CIO for it. **CIO**

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Taking Sides on Critical IT Issues

Should Software Vulnerabilities Be Posted Online?

JEFF JONES, SENIOR DIRECTOR of Microsoft's Trustworthy Computing security initiative, was quoted in late July in an Associated Press article making a statement that seems at first to be the understatement of the year. Referring to the online publication of code that could help hackers take advantage of a recently discovered flaw in most versions of Windows operating systems, Jones said, "We continue to believe that publication of exploit code in cases like this is not good for customers."

Jones's conviction that giving hackers the key to the castle seemed, to most readers, to be a statement of the obvious. The strange thing is, the obvious isn't so obvious to security experts. A great many security experts think the best way to make sure that security holes are plugged as quickly as possible is to get as much information as possible to the greatest number of people as quickly as possible. In other words, if more people are familiar with the problem, then more people will work on finding a solution. In the meantime, of course, posting that information is the equivalent of serving up a bomb for any company that has not yet installed the appropriate patches.



In July, several websites, following the lead of a "security research group" based in China, published the program that could allow hackers to gain control of a Windows operating system by entering the system through a hole in the Distributed Component Object Model Interface. Malicious hackers could put that knowledge to work creating mass-mailer worms that move from one computer to the next, leaving havoc in their wake. And while none of the code was published until nine days after Microsoft had announced the flaw and offered a patch, the publication ratcheted up the risk for those systems that had not installed the patch. On the other hand, its publication, and consequent publications (such as this one) about its publication, helped to warn of what some experts have called the worst Windows security hole in history.

The debate about whether to publish exploit code is clearly illustrated by the public response to this most recent episode. In

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Sound Off

this case, as in many cases, the first group to publish the code was not the group that discovered the flaw. That honor goes to a group of Polish experts known as The Last Stage of Delirium Research Group, or LSD, which found the flaw more than a month before it dutifully sent a message to Microsoft, which scrambled to create a patch. As it happens, LSD was not always such a good scout. Last April, the group was slammed by security experts after it released exploit code for a devastating Send-mail flaw. In response, LSD issued a public statement asserting its conviction that failure to publish detailed information about security flaws could be more damaging than publishing. This time around, LSD showed the kind of restraint that its critics had called for. The result: The group was slammed by security experts who agree with LSD's public statement.

What do you think? Does the publication of exploit code help or hinder Internet security?

Sound Off is a weekly column about current IT-related issues. Web Editorial Director Art Jahnke (ajahnke@cio.com) always welcomes feedback.

I THINK THIS IS THE WRONG QUESTION. SHOULD THERE BE exploits to be published online? is a better question. Just take a look at the long list of vulnerabilities published for just the past few days on sites such as Symantec. Nearly every major vendor of software is listed for some problem. Recently, we have had major busts on Microsoft and Cisco IOS that have kept my folks much too busy, and we no longer seem to have the time to test patches before the next one is released. How about a new feature in the feature-rich software: no vulnerabilities!

Gerald McGowan

*Security and Privacy Officer
Monette Information Systems*

I FEEL THAT THE QUESTION THIS ARTICLE ALLUDES TO IS MOOT.

Yes, we can logically support that it is unethical to post "holey" code before giving the vendor a chance to fix it, but honestly, this is a reflection of the world we live in. Get used to it.

I also sympathize with Gerald McGowan (previous responder) in that we no longer have time to test before implementing fixes. The immediacy of patch implementation and the frequency with which they are delivered are overwhelming. I applaud Microsoft and others for building very complex, feature-rich OSs and apps, but I lament the fact that I need to "manage" security patch updates weekly across the enterprise as part of my scheduled tasks.

Posting "at risk" code prior to notifying the vendor is selfish, short-sighted and malicious. People who do so should be penalized. Hackers don't think ahead to recognize the

billions of people whose lives are damaged by each attack. Their limited vision provides them only with glimpses of short-term authority absent long-term responsibility and consequences.

We as IT must maintain vigilance on all fronts. We owe it to our organizations, families and coworkers.

The question is no longer should buggy code be posted for all to exploit, but how do we defend against the inevitable?

James A. Taylor
CEO

AICompany.com

WHILE I STRONGLY AGREE THAT WE HAVE TO ALERT THE masses that a danger exists, I just as strongly believe that publishing the code gives even the most novice hacker the keys to the city. That places many more systems in danger than is necessary.

Microsoft isn't the only bad guy in this situation. We need to take some of the blame as we continually want bigger, faster, more fully integrated systems that will work with anyone's hardware and software and be completely secure.

We need to slow down on our requests for more and bigger, and instead require more secure. If we stop buying more—and only more secure—it will get their attention.

Robert Graves
Manager, Network Administration and Security

HOW THIS THING WITH MICROSOFT WORKS: 1. THEY DEVELOP software. 2. They sell the software to me. 3. The software has lots of bugs that damage my business. 4. They then demand that I pay an annual maintenance fee to fix the bugs (MS-TechNet is not free). 5. Instead of fixing the bugs, they develop a new version. 6. Instead of giving me the new version, they sell it to me. 7. I notice that many of my old applications no longer work. 8. I have to buy new versions of the languages (databases, whatever) needed to make them work. And guess what! I have to buy all of this from Microsoft. 9. I then have to fund the reprogramming and testing of replacement software (talk about a lack of ROI here!). 10. Then the cycle starts over.

Should they be responsible for the security bugs? They should be responsible for all bugs. But, unfortunately, our lax government is not willing to enforce the antitrust acts against a monopolist.

Jim Smith
Management Consultant

SUFFICIENT INFORMATION SHOULD BE PUBLISHED TO ALLOW users to determine if they need a fix or patch, but not enough information to give anyone enough to exploit that code.

Robert Firestone
*President
Systems Development Enterprises*

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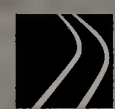
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Beware of the Telephone

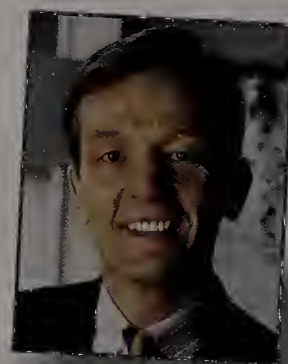
I RECENTLY ATTENDED a presentation by Kevin Mitnick, the infamous and reformed hacker and president of Defensive Thinking, a consulting and training company aimed at helping clients prevent information theft. His topic was social engineering, a concept focused on what Mitnick considers to be the weakest link in corporate infrastructure security—human beings.

According to Mitnick, too few companies have stringent security governance policies and procedures in place. Information is not valued, and most employees—besides receiving e-mails from the IT department about this virus or that—are clueless as to the real threats of damaging security breaches.

Most employees think of hacks originating via a computer. Wrong, says Mitnick. He points the most damaging finger at the telephone, a device preferred by social engineering hacks to extract small pieces of seemingly useless information that they can then piece together to cause catastrophic security breaches.

Telephone-enabled hacks are preferred by the really smart bad guys over computer hacks because there is less of an audit trail. Moreover, telephone break-ins work against any company regardless of its tech infrastructure.

According to Mitnick, social engineering hacks target four typical categories of employees: low paid employees and staff with low morale; executive gatekeepers; remote office workers; and new hires. To prevent security breaches, Mitnick encourages people never to share or transmit their e-mail or network



Gary J. Beach

log-in passwords. He recommends companies pay particular attention to remote workers by counseling them to be especially vigilant in protecting remote access dial-in data. He advises companies to put generic e-mail addresses on their websites such as *sales@cio.com* rather than revealing the real e-mail addresses of real employees (*gbeach@cio.com*). If a sophisticated hacker can easily guess your company's e-mail nomenclature, that hacker can do lots of damage fast.

Social engineering criminals are adept at surveillance techniques, and they are also experts at exploiting human trust. Plus, they are avid readers of IT employment ads in local newspapers or sites like Monster.com—ads that often provide great detail on the tech infrastructure in place at their intended target. Paper shredders, too, might be a good deterrent; according to Mitnick, hackers are skilled Dumpster divers!

Feeling secure? Several months back, this column suggested the formation of the Security Underwriters Laboratories, or SUL (see "Certify Security," www.cio.com/printlinks), a group that would focus a great deal of energy in auditing security governance policies and procedures. Too many companies are penny-wise and pound-foolish when it comes to addressing their most vulnerable security threat: employees. A strong SUL would address that need. Drop me a note with thoughts on how collectively we can get the SUL started.

As Mitnick is fond of saying, "There is no patch for stupidity."

PHOTO BY WEBB CHAPPELL



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By Susan H. Cramm

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Reader Q&A

How comfortable do you find the hot seat? E-mail Leadership and Management Editor Edward Prewitt at hotseat@cio.com.

Secrets to Managing Techies

IT employees are different. Here's how to lead them.

BY MEGAN SANTOSUS

If you want to be a better leader of your IT staff, then it's best not to rely on that staple of leadership books, the profiles of military leaders such as Attila the Hun, George Patton or Colin Powell. IT employees don't respond well to a leadership style based on power and control. That's because IT work—programming, systems analysis, troubleshooting and the like—is centered on individual problem-solving that can't be directed from above.

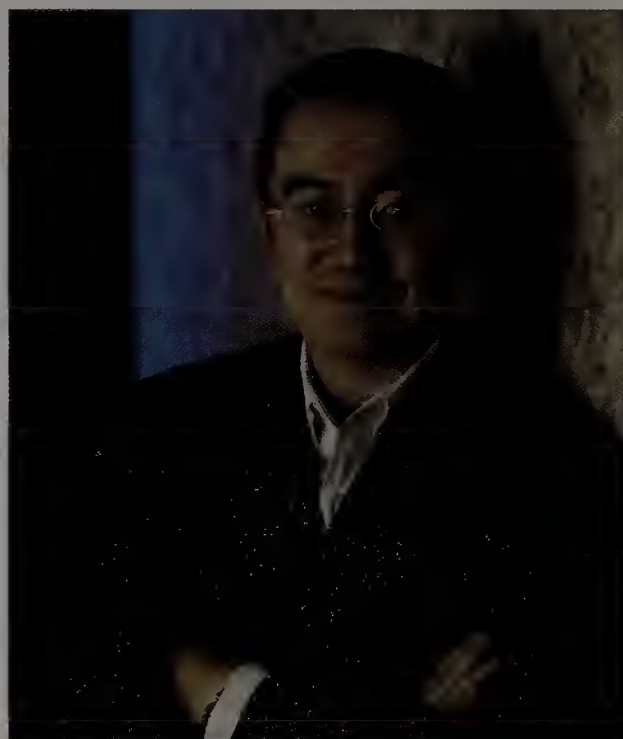
Since IT work is inherently creative, effective leadership of IT workers means facilitating work that is often chaotic and goals that are rife with ambiguities. The context of leading an IT organization includes aligning IT projects with business strategy, conveying direction to IT employees that's consistent with that strategy, and keeping IT employees focused on end user needs.

Some big-picture leadership skills, such as communication, vision and negotiation, are the same whether one is a CEO or a CIO, says Paul Glen, author of the recent book *Leading Geeks: How to Manage and Lead the People Who Deliver Technology*. "At its heart, leadership is all about relationships with people," he says.

But IT leadership skills diverge into unique territory when CIOs are immersed in the day-to-day operations of an IT department. They must motivate IT workers who thrive on challenges and aren't primarily driven by monetary carrots or perks, and who love technology but sometimes need to be pushed to apply it in ways that help others do their jobs. What's more, many CIOs (who still tend to come up through the IT ranks) make the mistake of focusing on technol-

ogy rather than employees, Glen says.

No wonder that in a recent CIO survey, underlings don't give CIOs high marks for leadership. Of the 400 participants in our online "What Do You Think of the CIO?" survey, only about half said their CIOs foster a team environment, use praise and constructive



Documentum CIO George Lin bans all tech talk among IT staffers until they understand the business effects of a project.

feedback to motivate, and delegate effectively (for the complete survey, go to www.cio.com/printlinks). Here's how to get on the right side of that divide.

Embrace Your Inner Techie

They might bristle at stereotypes, but IT employees do share certain tendencies that set them apart from workers in sales, finance and manufacturing. As creative problem-solvers, IT staffers get absorbed in whatever projects they are working on, often at the expense of relating to col-

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leagues outside of IT. As technology aficionados, IT employees sometimes don't have much patience with people who don't

share their enthusiasm for all things technical. And when it comes to organizational politics and Machiavellian maneuvers, most IT people couldn't be bothered. For their part, employees outside of IT may not appreciate the nature of IT work, so CIOs need to serve as a bridge between disparate groups.

Grasp the traits that make IT employees tick to provide them with direction, motivation and goals. Kevin Orr, a former CIO for the Army hospital at Fort Rucker in Alabama, finds parallels between IT workers and artists. "IT people tend to work in tremendous spurts interspersed with dry spells," he says. Currently a systems engineer at Northrop Grumman Mission Systems, Orr says it's essential that CIOs provide IT employees with clear guidelines on tasks and communicate overall goals. But when it comes to the day-to-day work, CIOs need to let IT employees pace themselves as long as quality and deadlines aren't compromised. Yet even CIOs who enjoy an insight into the IT mind worthy of Freud won't get far if they lack credibility and respect from their staffs. That's where technical knowledge comes in.

As far as leadership goes, "the major difference in being a CIO compared to a CEO is that IT people have little tolerance for anyone who doesn't understand what they do," says Steven Steinbrecher, former CIO of Contra Costa County in California. "If they think you are technology-stupid and they can buffalo you, they will." Steinbrecher, who retired in July after nearly 30 years in IT, says that in every CIO job he's had, at least one employee showed up at his office within the first few weeks to test his knowledge.

Jeff Chasney, executive vice president and CIO of CKE Restaurants, sounds a

similar note. "Credibility is the key separating effective leaders from less effective ones," he says. "If you have a baseline of knowledge, if you question IT employees on their assumptions, they'll develop a deep appreciation for you."

The depth required for a CIO's technical knowledge depends to a great extent on the size of the organization. When complemented by a CTO, CIOs can succeed with less technical acumen

units. Techies may think the world revolves around technology, but it's the CIO's job to make sure technology takes a backseat to business needs. CIOs should constantly hammer this message home in a way that doesn't ruffle any IT employees' feathers. George Lin, vice president and CIO at Documentum, a provider of content management software, keeps business needs at the forefront by banning technology talk with

MANAGING YOUR I.T. ORGANIZATION

Four Essentials for Leading Techies

IN HIS BOOK *Leading Geeks: How to Manage and Lead the People Who Deliver Technology*, self-described geek and consultant Paul Glen identifies four actions indispensable for CIOs who hope to lead IT staffers.

- 1. Motivate the ranks.** Avoid incentives designed to promote certain behavior (for example, staff the help desk 12 hours a day) and concentrate instead on creating conditions (such as establishing career paths and setting achievable, measurable goals) under which motivation can develop.
- 2. Facilitate teamwork.** IT staffers shouldn't work in isolation. It's your job to encourage and coordinate the free flow of ideas and activities among the various IT teams.
- 3. Publicize achievements.** Let the business side know exactly how IT contributes to the strategic goals of the organization.
- 4. Provide clarity.** So that IT employees aren't working in the dark, explain the goals of your department, highlight project priorities and outline individual responsibilities.

as long as they understand how IT work gets done. At bottom, "the IT staff needs to know that the individual leading the organization, setting the strategic direction and working with customers is someone who understands what it takes to make IT happen," says Terese Butler, the deputy director of IT at California's Employment Development Department.

A high-level understanding of technology is essential for another reason as well: the CIO's role of intermediary between the IT group and business

his IT employees. "I never talk technology to my own people," he says, opting instead to "talk about how their work is related to the business."

To discourage conversations focused on technology, Lin demands that his 75 IT staffers first understand the business. In tackling a systems integration project, for example, Lin requires IT folks to first draw out the entire business process flow involved in the project before they can focus their attention on specific EAI tools.

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Know Where IT Should Go

When it comes to motivating IT workers, a hands-off philosophy works best. "If you

know how to work with techies, they are the easiest kind of employees to motivate," says Chasney. "They don't need cushy perks, personal recognition or bonuses; they thrive on creatively solving problems." When CKE Restaurants recently launched a project to retrofit DOS-based software onto new Windows-based point-of-sale hardware, Chasney challenged his team to come up with a way to do it without cracking the existing code, an approach that required heavy-duty technical wrangling. By encouraging his people to look at the problem in a different light, they came up with a simple, elegant solution in two days. Chasney's lesson: Don't tell IT people how to solve a problem. Plant an idea of where you want them to go, give them the resources they need, and let them find their own path to the solution.

One ongoing leadership challenge for CIOs is communicating how IT contributes to the business. This isn't only about establishing ROI (although that's always a bugbear); it's about boosting the morale of IT employees by showing them how their work aids and abets business performance. "Evaluating and recognizing our contribution is tough in IT because we're a couple of steps removed from the end result," says Tim Buckley, managing director of IT at financial services company The Vanguard Group. With a typical project lasting 12 to 18 months, IT employees don't always see how their work pays off. That's a problem when the IT department itself is judged on how effectively it supports the business. CIOs have to highlight IT's contributions to both employees and business users. "It comes down to communicating overall organizational goals and showing employees what their roles are in [fulfilling] those,"

MANAGEMENT REPORT The Loyalty Lag

Ten Ways to Develop the Truly Loyal Employee

Employees who stay put should not be confused with those who stay loyal, according to a new, comprehensive study of worker attitudes in business, nonprofit and government organizations. Walker Information, a research company specializing in loyalty and satisfaction measurements, released a workplace loyalty report in September. The study distinguishes the "truly loyal" employees from those who stick around only until a better job comes along or those workers who feel trapped in their jobs.

Only the truly loyal workers will go the extra mile to delight customers and are highly motivated in their work. These employees also would resist offers of other jobs and would recommend their companies to potential employees. Too bad they're so scarce. Only 30 percent of survey respondents met the criteria. Even so, Marc Drizin, a vice president at Walker and the company's loyalty specialist, finds this percentage surprisingly high, especially in light of the recession. His explanation is that employees who have lasted through layoffs sometimes feel gratitude and obligation toward their companies.

On the other side of the coin, 34 percent of respondents were classified as "high risk" (meaning they were neither committed to their work nor planning to stay with the company for the next two years), and another 31 percent qualified as "trapped" (not attached to their work or employer but without prospects for other jobs). So what management actions produce the truly loyal employee?

Walker measured the attributes of the truly loyal along two dimensions: experiences and attitudes. When it comes to employees' personal experiences of their workplaces, the top five drivers of loyalty are:

1. Care and concern that the employer shows for workers—displayed by working conditions, policies and style of management.
2. Fairness of pay and evaluations.
3. Employees' feelings of accomplishment in their work.
4. Satisfaction with daily activities.
5. Management appreciation for employees' ideas and input.



Regarding employees' attitudes about their work and workplaces, the top five drivers of loyalty are:

1. An employee-focused atmosphere in the office—demonstrated by a clear priority put on staffers.
2. Development opportunities—evinced by training.
3. The quality of the employee's job.
4. The corporate brand—that is, how the employee feels about it.
5. Personal sacrifice required for the job—that is, the so-called work-life balance.

—Edward Prewitt

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says Butler. To showcase the role of IT to the business side at California's Employment Development Department, she has invited

developers to give project demos to execs, making sure to emphasize how the project improves productivity.

IT staffers place great value in ongoing training, but typically it's technical updates they want, not management training. Ideally, your workers should develop skills that build professionalism in the IT group and align with the company's needs. At Documentum, where the business side puts a premium on soft skills such as customer service and negotiation techniques, Lin works with the HR department to provide IT people

"If you know how to work with techies, they are the easiest kind of employees to motivate. They don't need cushy perks; they thrive on creatively solving problems."

—Jeff Chasney, executive vice president and CIO, CKE Restaurants

with training in those areas. "Without the soft skills, IT people won't be very successful working with our internal customers," Lin says.

The CIO's ultimate role is to harness technology for the organization's best use. The most successful CIOs know what motivates their staffs and how to lead them toward success. **CIO**

Send your feedback to hotseat@cio.com. Opinion and Knowledge Management Editor Megan Santosus can be reached at santosus@cio.com.

Leadership Agenda BY SUSAN H. CRAMM

The M.I.A. CIO

Five ways to regain your focus—and retain your job



You are in a funk. Your work has turned into a grind, your calendar is out of control, and issues are growing into problems. The focus and energy that you once had are dissipating. People in your organization have noticed—they describe you as distracted, disengaged and tense. You are the missing-in-action CIO—present in body but not in mind and spirit.

You are not alone. Ninety percent of professionals are living a less than purposeful existence—either in a state of disengagement, distraction or procrastination—according to Heike Bruch and Sumantra Ghoshal, authors of "Beware the Busy Manager" (*Harvard Business Review*, February 2002). What state you find yourself in, say the authors, depends on the relative levels of two factors: focus, which is "the ability to zero in on a goal and see the task through to completion," and energy, defined as "vigor that is fueled by intense personal commitment."

Most likely, you started off in your current position with a strong sense of purpose and the ability to see problems and solutions in stark relief. You defined and tackled your laser-sharp agenda with limitless energy and enthusiasm. But as time passed, you lost interest or ran into obstacles or got overloaded and joined the suffering 90 percent.

Great leaders understand how to renew their leadership agenda. They have the self-awareness and self-discipline to identify and overcome their malaise. Many of us have used job-hopping as a primary means of leadership renewal. Although crude (in that it does not force you to face the root causes of your leadership malaise), it is effective—as long as there is a strong job market and you are a hot commodity. Now more than ever, given the weak economy and aging demographic, the ability to renew your focus and energy and regain your purposeful footing is important. If you are ready to take back your job, here's what you should do.

MAKE THE TIME. It should come as no surprise to learn that purposeful leaders schedule time on their calendars to think and reflect. Many hectic managers find this task almost impossible and require outside assistance from a trusted adviser to help them do calendar analysis and surgery. Since your schedule consists primarily of meetings, the easiest way to make time is to reduce the frequency and duration of meetings (try saying, "When someone asks for one hour, they get half an hour"), eliminate certain meetings ("I don't meet with vendors") and activities ("My assistant answers my phone and reviews e-mails" or "I read e-mails and check voice mail once a day"), and delegate project work that you have picked up along the way.

OPEN YOUR EYES. Balanced feedback will motivate and sharpen your focus and build your commitment on the issues and opportunities that need to be addressed. Go regularly to the front lines of your organization (where

A black and white photograph of a person rock climbing a steep, textured cliff face. The climber is wearing a dark t-shirt, shorts, and a harness, and is secured by a rope. The background is a clear sky.

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your employees interact with their customers and suppliers) to assess your positioning and identify opportuni-

ties around shareholder value, customer service and cost-effectiveness.

GET OTHERS INVOLVED. Leaders aren't expected to have all the answers, and leadership is not a solitary pursuit. A collaborative process of defining goals, strategies, priorities and tactics will strengthen commitment, increase your influence and energize everyone involved. In addition, if you are risk-averse, sharing priorities and responsibilities will go a long way to quiet your fears about the career impact of setbacks and failures. For more information on strategy-making, see my previous column, "Strategic Fitness," at www.cio.com/printlinks.

EXPRESS YOURSELF. Someone once said, it is easier to maintain your focus and energy if your career expresses who you are rather than what you do. Look at a CIO who is an adrenaline junkie (with hobbies like car racing, flying and downhill skiing). The CIO role is going to drive him crazy unless he figures out a way to keep initiatives on a fast cycle time and lets people with a longer attention span run operations.

WORK WITH A NET. If the prospect of losing your job makes you queasy, you need a safety net that gives you the freedom to define your leadership focus and approach. Some of you are blessed with a mental safety net (your outlook is that "everything is going to be OK"), while the rest need something more tangible—safety nets that ensure that your financial needs will be met. There's nothing like money in the bank and the ability to earn a living as a contractor or consultant to give you the courage to take risks, make hard

decisions and negotiate effectively.

The leadership renewal process I've outlined here requires that you leave your "old" job, assess your effectiveness, and replace yourself with a more effective successor. Do yourself and your organization a favor: Mentally fire yourself today and walk in tomorrow like it's your first day on the job.

Reader Q&A

Susan H. Cramm answers questions on "The M.I.A. CIO"

Q: Your article describes my situation perfectly. I am a CIO for a very successful financial services company. My job is very challenging, rewarding and boring. I have built a great working relationship with my boss (the CEO) and other executives. However, I am finding myself losing more interest day after day. I want to quit my job altogether and join a small startup where I can expand my responsibility over other areas such as sales and marketing, product development, and operations. Do I exhibit typical signs of burnout, or am I just going through a midlife, midcareer crisis?

A: Don't ignore your current feelings, but don't change for change's sake. Base any actions on insights on your skills, knowledge, talents, motivators, likes and dislikes, and practical considerations regarding financial security, prior experience, networking and reputation. I am currently working with a client who wants a change but is security-minded given his family responsibilities. We have identified his career goal and opportunities within his current company that will help move him forward. For more information on defining your career destination and plan, please read one of my previous columns, "Is This Job All There Is?" (www.cio.com/printlinks).

Q: A couple of things are missing from your list of what to do. A focus on family and friends is more important than spending all my energy at work. Those are the true lasting relationships. It's there that I gain my energy to work. My family members also help me focus on work because of the importance of supporting them. Also, you neglected outside interests; hobbies, sports and so on are how people recharge themselves. Life isn't all about work.

A: Congratulations! It sounds to me like you are a proud member of the purposeful 10 percent. In your case, you express yourself by ensuring that your work supports your desire to nurture and support your family and foster relationships. My guess is that your focus on relationships is something that is part of your personal DNA and that you are able to express it on a day-to-day basis in your job. It's true that life isn't all about work. It's also true that if you are spending 10 hours a day doing things that don't feed your soul, you will ultimately join the suffering 90 percent.

Q: Most of us are disengaged, distracted or procrastinating. Can anybody really avoid that? I don't know anyone in that 10 percent group.

A: It is true that the purposeful 10 percent are the enviable minority. Regaining purposeful footing is difficult because the catalyst for change must be created internally. The renewal process requires the self-awareness to identify the need for change, the self-discipline to work through the discovery process, and the self-confidence to put your insights into action. **CIO**

To see more reader questions and answers from Susan H. Cramm, go to www.cio.com/leadership/agenda.html. Cramm is president of Valuedance, an executive coaching firm based in San Clemente, Calif. Her e-mail address is scramm@cox.net.



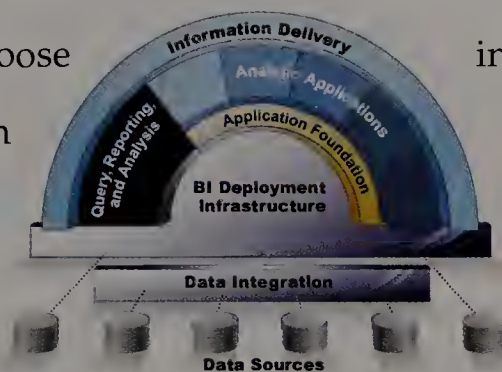
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Retreat Moderator

Peter Weill

Director, Center for
Information Systems
Research, MIT Sloan
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The Case Studies

Peter Weill once again presents new findings and case studies from work with hundreds of Global 1000 companies, focusing on three key areas: IT infrastructure for strategic agility, effective business models, and IT governance.

► IT Infrastructure for Strategic Agility

Strategic agility – the ability to implement new business initiatives quickly and cost effectively – will be an increasingly important capability for enterprises in 2004. IT infrastructure is one of critical platforms required for strategic agility. Investing in the right infrastructure at the right time enables rapid implementation of future electronically based business initiatives and cost reduction of current business processes—i.e., more business value. This session presents a framework for senior executives to view IT infrastructure in business terms and to lead in making investment decisions. Weill illustrates how firms successfully implement and exploit their IT infrastructures with several case studies.

► Do Some Business Models Perform Better than Others?

In an increasingly connected business world the business

model—what a firm does and how they make money—is a critical strategic decision. Understanding what business models are used, how they are

combined, and which are most successful is important for every senior manager. In addition, firms implementing each model use IT differently—resulting in different IT portfolios. This presentation provides a new and powerful way to analyze a firm's business model and then think about the IT needs.

► IT Governance Workshop

In response to strong interest in last year's session on IT governance, Weill leads a workshop on how top performers govern. He presents case studies and insights from MIT CISR's study of effective IT governance in 256 enterprises in 23 countries. A framework is presented in this workshop to analyze and communicate governance, illustrated with cases studies of top performers.

► Monday's Case Study Workgroups

Monday at lunch we divide into small groups to investigate the link between business strategy and IT infrastructure in a new case study. The case is based on a global multi-business unit firm in the healthcare industry moving from a fully decentralized approach to information technology to providing some firm-wide IT infrastructure. The challenge for your group is to advise the newly appointed CIO. Groups will report back with their recommendations.

The Enterprise Value Award Winners

They're scrutinized by CIO editors, Review Board members, and our judging panel of top-notch CIOs. Meet the winners of the prestigious CIO Enterprise Value Award and learn how they delivered true value.

► The Value Proposition

Our panel of CIO Enterprise Value Award winners talks about the ongoing difficulty inherent in demonstrating and delivering IT value. How do you convince your CEOs, CFOs and COOs—who may think IT is just a commodity, a utility—that its intelligent application and deployment can and does indeed bring strategic value to the business.

► Monday Night's Gala Awards Ceremony & Dinner

We'll announce the winner of the Grand CIO Enterprise Value Award—and honor all the winners in the industry categories at a black-tie reception, awards ceremony and dinner. It's a great time to celebrate with your CIO peers.

► Conversations with This Year's Winners

We offer breakout sessions with the CIOs of this year's winning organizations. It's your chance to talk at a more intimate level, discuss their particular case in more detail and take away lessons you can apply to your own organization back home.

The Peer Networking

CIOs tell us it's as important to have opportunities to meet informally with their peers as it is to participate in the Retreat sessions. We give you more opportunities to meet and learn from more of your peers over three days, with the golf tournament Sunday morning, informative chats at breakfast and lunch roundtables, the intensely interactive case study workgroup sessions, and relaxed conversations during the daily receptions. And we're happy to hook you up with other attendees or corporate sponsors you'd like to meet.

Sunday Night Special Event

Jimmy Tingle's Uncommon Sense

It's a scary, unpredictable—and absurd—world we live in. Satirist, comedian and commentator Jimmy Tingle takes us on a highly personalized tour of the absurdities of modern life. You've got to laugh to survive.



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CIO Contact Information

Editorial, Advertising and Business Offices: 492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9208, 508 872-0080.

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EXECUTIVE Summaries

October 1, 2003

COVER STORY | Web Services Standards Battle

Christopher Koch | 54

The year 2003 will not be known as the year of Web services; more likely, it will be remembered as the year the standards process began to fall apart. No fewer than four organizations—Liberty Alliance, Oasis, W3C and WS-1—are vying to preside over the process, each with different goals and degrees of power and influence. Uneasy and fragile alliances quake under the pressure of enormous revenue potential, and bickering seems to doom the outcome, promising a proliferation of confusing, duplicative Web services standards emerging in the next few years. Some will be proprietary, and some will not, with unclear patent and licensing implications for CIOs. And the ultimate result will be a lot of wasted money for CIOs. Though some practitioners, including Fidelity, GM, J.P. Morgan Chase and Kaiser Permanente are participating in standards bodies, it's a time-consuming commitment, so vendors continue to dominate. If CIOs remain on the sidelines, they will end up forced to choose from among multiple Web services standards that may not interoperate, may have limited life spans, and may come with fees or other onerous patent and licensing requirements.

“The structure of these groups is backward. The users should be the ones creating the standards, and the vendors should be adopting them. Right now, users have to take what the vendors feed them.”

—Eric Austvold,
research director for AMR Research

Web Services Risk Mitigation

By Elana Varon | 64

MANY COMPANIES THAT HAVE EXPERIMENTED with Web services are beginning to put pilot projects into production. The smartest—including Motorola, the U.S. Navy and Wells Fargo—are taking an enterprise view, developing policies for the technology's strategic use that take into account its effect on existing IT infrastructure and applications. Their strategies seek to mitigate the five major risks of Web services: lack of security, unsettled standards, questionable vendor viability, uncertain adoption by trading partners and lack of enterprise ROI evidence. For example, the Navy's coping strategy is to use its market influence with standards organizations to cajole vendors into supporting as many of the emerging standards as possible. The Navy's vendor neutrality presumes infrastructure vendors will eventually provide products to work with any standard and therefore mean easy integration. Motorola has decided to hedge bets by investing in both Sun's and Microsoft's competing Web services development platforms.

It Ain't Over Until You Do the PIA

By Meridith Levinson | 74

ALTHOUGH ONLY 20 PERCENT of IT shops in the general population perform post-implementation audits (PIAs) on IT projects, 66 percent of companies honored with the CIO 100 Award for resourcefulness this summer routinely conduct audits. That ought to tell you something. PIAs are among a resourceful company's best tools for proving the value of high-cost, mission-critical IT investments and for gleaning project management best practices, which CIOs can then apply to subsequent projects. Companies, including manufacturer Greif, Honeywell Aerospace and Sun Life Financial, have found ways to overcome political and resource hurdles to make audits a routine project management practice. They've figured out the best timing for audits, who should conduct them, how to make the findings actionable and how to incorporate learning back into project practices.

The Business Education of Jan Franklin

By Alice Dragoon | 84

FRANKLIN SPENT ONE AND A HALF YEARS as an executive director on the business front lines before becoming CIO of Farmers Insurance, an experience that yielded valuable lessons for any CIO. Once known as a no-nonsense manager with little patience for office politics or excuses, Franklin realized the importance of listening to those in the field. She introduced metrics to the service center she managed, a concept that took getting used to for some, but even initial measurements showed improvements. However, she learned that metrics don't tell you everything: A seemingly innocuous system hiccup can have a huge impact on customer service. Above all, she's learned a new style, one that's much more collaborative. Nowadays, she's more likely to coach than dictate.

Hot Seat: Secrets to Managing Techies

By Megan Santosus | 98

CIOs WHO WANT TO BE EFFECTIVE LEADERS need to emulate psychologists rather than sergeants. IT employees don't respond well to a leadership style based on power and control. That's because IT work—programming, systems analysis, troubleshooting and the like—is centered on individual problem-solving rather than activities that can be directed from above. CIOs must facilitate work that is often chaotic and goals that are rife with ambiguities. Their leadership goals include aligning IT projects with business strategy, conveying direction that's consistent with that strategy and keeping IT employees focused on end user needs. Too often, though, CIOs (revealing their roots in the IT ranks) make the mistake of focusing on technology rather than employees. Finally, when it comes to developing IT career tracks, CIOs have to take the lead: IT workers—motivated more by technology than status or ladder-climbing—often treat career development as an afterthought.

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